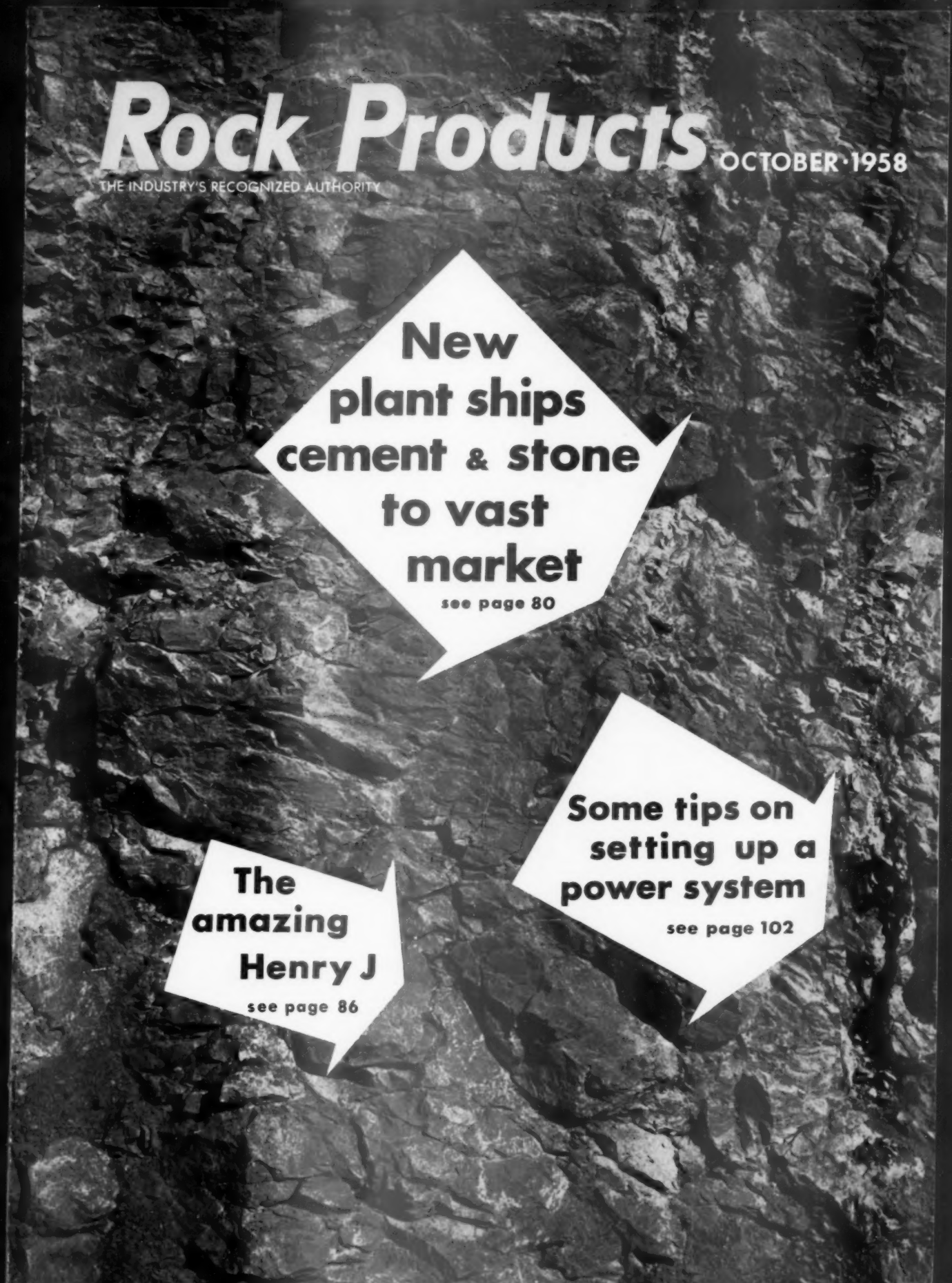
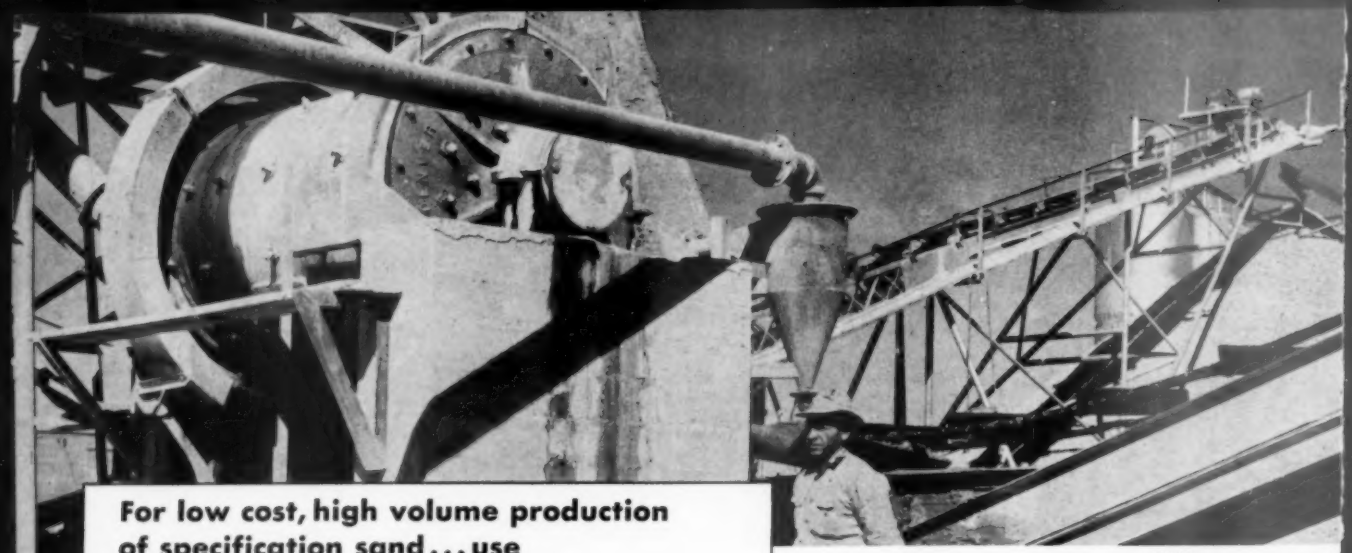

Rock Products
OCTOBER·1958
THE INDUSTRY'S RECOGNIZED AUTHORITY
New plant ships cement & stone to vast market
see page 80
Some tips on setting up a power system
see page 102
The amazing Henry J
see page 86



For low cost, high volume production of specification sand...use

DENVER
Steel Head
ROD MILLS

Up to 10' x 20' sizes, small and large discharge

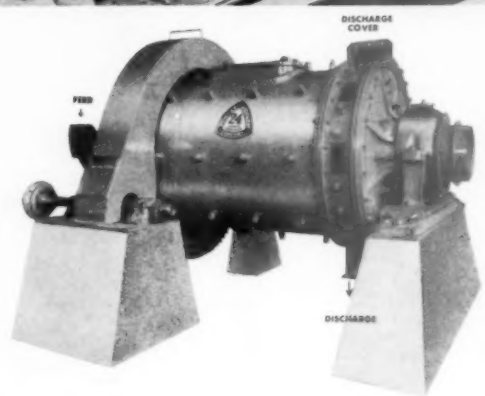
If you are faced with a shortage of sand—want a profitable solution to the problem—here is the kind of help you will appreciate.

DENVER Steel Head Rod Mills turn waste fractions or surplus stone into specification sand for concrete, mortar or asphalt—quickly, easily and profitably. What's more, you get a graded product that's sharper and cleaner.

No-charge grinding test shows size mill required, tonnage and product analysis. Let us check your own engineers' calculations.

We have helped many mill operators with our more than 30 years of grinding experience. Complete grinding test facilities are available at no charge to establish a grindability index that can be translated into the correct size mill to solve your problem, increase your profits. For example, we recently conducted a test so an operator could check the recommendations of another manufacturer. Where a large mill had been recommended, our experience in grinding techniques determined and demonstrated that a smaller DENVER mill would produce the desired product and tonnage—a saving of over $20,000 in initial cost and over 100 HP.

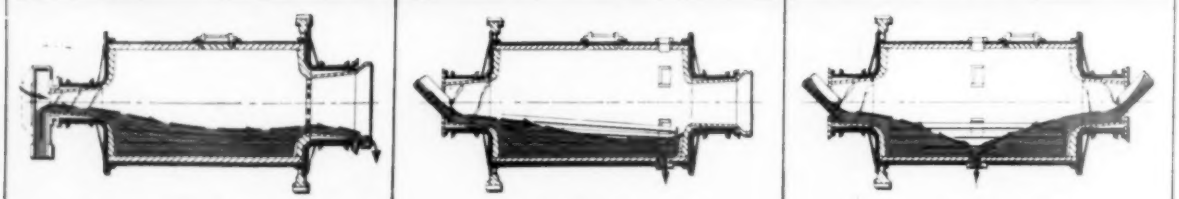
Write for "Production of Specification Sand by Rod Mills"—a bulletin of technical information for operators who have sub-specification sand deposits.



Specifications of 6' to 10' diameter DENVER Steel Head Peripheral Discharge Rod Mills include:

Cast steel heads; sealed, self-aligning trunnion bearings; continuous oil reservoir trunnion bearing lubrication; adjustable, single-unit sole plate under trunnion and drive pinion. Length and diameter measured *inside* liners for greater capacity. End peripheral, center discharge peripheral overflow, perforated overflow, or return spiral and grate discharge available. Balanced operating speed lowers steel consumption, gives highest capacity at lowest cost.

DENVER STEEL HEAD MILLS SHOWING TYPICAL DISCHARGE ARRANGEMENT



Medium or Large Trunnions with or without Grate Discharge

Direct Feed, End Peripheral Discharge

Direct Twin Feed, Center Peripheral Discharge

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Complete Mill Equipment

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B.F.Goodrich



Soaking wet gravel climbs high and steep with no slips, no slides

B.F.Goodrich improvements in rubber brought extra savings

Problem: That conveyor belt carries gravel from washing plant to stockpile. But the incline angle is so steep that the wet, slippery aggregate would sometimes slide down faster than the rubber belt could carry it up. Gravel would pile up at the bottom, production slowed down.

What was done: Then a B.F.Goodrich man told the sand and gravel company about a special kind of belt, developed by B.F.Goodrich, to handle wet materials. This "Riffle Grip" belt, as it is called, is made with a series of extra-tough rubber ridges molded into the cover. The tread that these ridges form holds the gravel in place, and at the same time, channels the water to the edges of the belt where it drains down.

Savings: This B.F.Goodrich belt was tried, and it works perfectly. The gravel flows smoothly uphill. More tons can be handled with no slipping, no sliding, no problems of any kind.

Extra benefits: Another important advantage is that just by using different angles of incline and troughing idlers, this same belt can carry such sloppy materials as wet mixed concrete and keep the water from draining away.

Where to buy: Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich conveyor belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Dept. M-449, Akron 18, Ohio.*

B.F.Goodrich *conveyor belts*

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OCTOBER 1958

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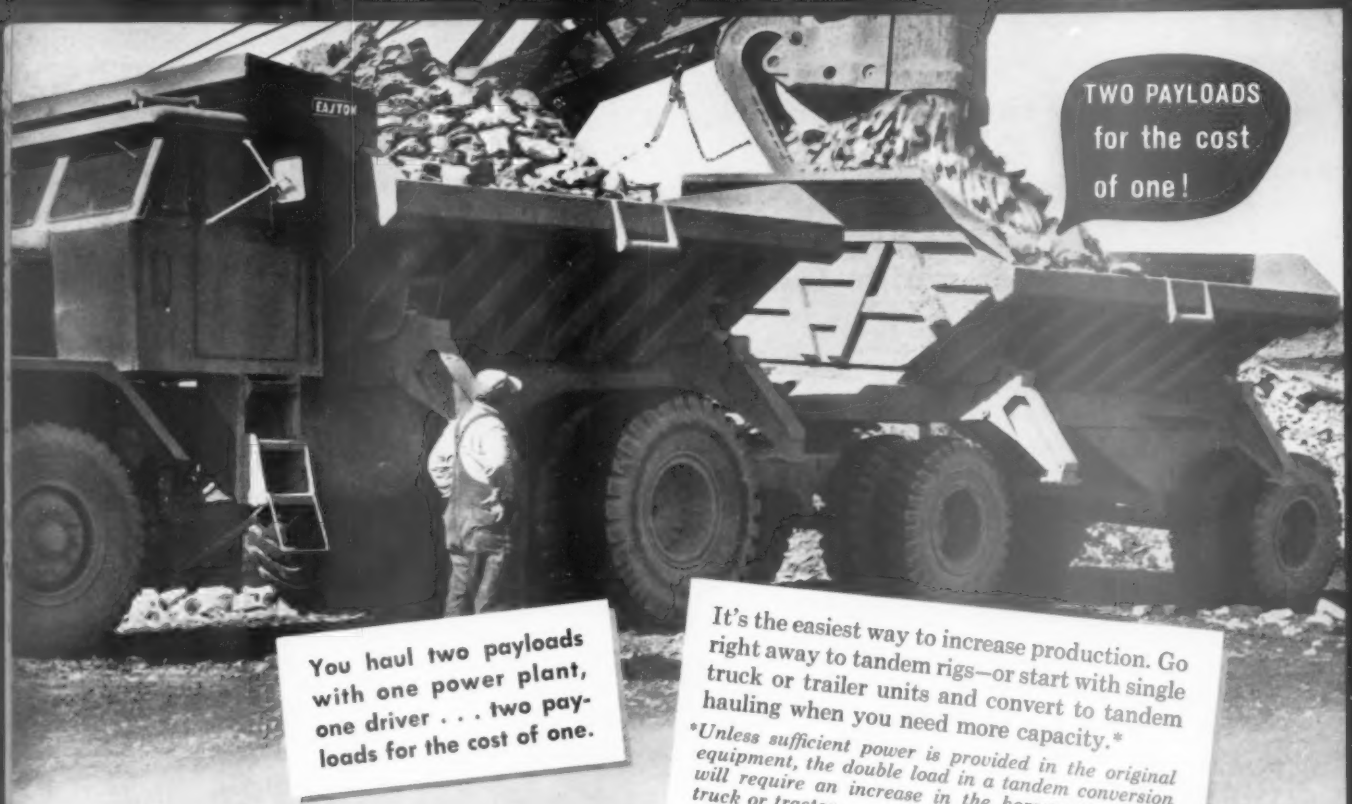
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You haul two payloads with one power plant, one driver . . . two payloads for the cost of one.

It's the easiest way to increase production. Go right away to tandem rigs—or start with single truck or trailer units and convert to tandem hauling when you need more capacity.*

**Unless sufficient power is provided in the original equipment, the double load in a tandem conversion will require an increase in the horsepower of the truck or tractor.*

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PARLAYED 3 DRILLMASTERS INTO 18

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These three case histories tell a story that is vitally important to anyone engaged in blast hole or water well drilling. If you want to improve your profit picture in a growth business, it will pay you to look into the many exclusive advantages of the I-R Drillmaster and DOWNHOLE drill. Ask your Ingersoll-Rand representative for complete information, or send today for a copy of Bulletin 4179.



Sullivan Trail Coal Co.
West Pittston, Pa.

To speed coal stripping operations at a number of separate mining properties, Sullivan Trail purchased its first I-R Drillmaster on June 7, 1955. This was a TRUCM rig, mounted on a 6-wheel highway truck and equipped with the revolutionary I-R DOWNHOLE drill. The speed with which this unit penetrated the hard and broken rock overlaying the coal strata made an immediate "hit"—and its ability to quickly change over to straight rotary drilling for the shales and less abrasive formations made it even more desirable. The investment proved so profitable that *two more* TRUCM units were purchased on Feb. 3, 1956—and still *another*, on Nov. 2, 1956! This fleet of four rugged and highly mobile units proved the ideal solution to all jobs where frequent over-the-road movements were required. And for the large stripping operations, where one drill could be kept on the job most of the time, *two* crawler-mounted DM-3 Drillmasters were added on Aug. 8, 1957. All *six* of these heavy-duty blast hole drilling rigs are equipped with I-R DOWNHOLE drills and long-lasting Carset Bits—an unbeatable combination for lower cost per foot of hole.



C. S. Garber and Sons
Boyertown, Pa.

This contract driller purchased his first TRUCM Drillmaster unit on Jan. 25, 1955—primarily for blast-hole drilling on quarry jobs where fast moves were required from one quarry to another. Equipped with the I-R DOWNHOLE drill, it set entirely new standards of performance and costs. Then they tried it on a *water well job*—with such phenomenal success that *another* TRUCM unit was ordered on March 23—and *two more* on June 7 of the same year! The profit potential of these machines for water well drilling soon made this a major use of the DOWNHOLE drill, and business boomed to the point that *two additional* TRUCM units were added to the Drillmaster fleet—in April and July of 1957. Today, these six I-R Drillmasters, with I-R DOWNHOLE drills, are meeting all requirements for a greatly increased business in both quarry and water well work—an increased work load for which the machines are largely responsible. The ruggedness and roadability of the TRUCM mounting makes it ideal for contract drilling where you're here one day—and miles away the next.



New Jersey Drilling Co.
Madison, N. J.

Today, this company is one of the largest and most successful contract drillers in the State—operating a fleet of *six* I-R Drillmasters for both quarry and water well work. This "success story" really began only a little over three years ago. On May 25, 1955, to be exact—the date on which they purchased their first DM-2 crawler-mounted Drillmaster with I-R DOWNHOLE drill. Here, too, it was used initially for blast hole work in quarries—then applied to water well drilling. This proved so profitable that *another* DM-2 was purchased on Nov. 9, 1955. And in April, 1956, a TRUCM unit was obtained for use solely as a high-speed, highly mobile water well drilling rig. As business and profits increased, *two more* DM-2s were purchased—in July and August of 1956. And on Sept. 17, 1957, the entirely new TRUCM-3 unit, on I-R's specially designed Crane Carrier vehicle, completed the present Drillmaster fleet. All six units use the I-R DOWNHOLE drill—the ideal setup for hard rock water well drilling. To prove the point, one TRUCM-3 unit drilled 50 wells in granite in 3 months, averaging 100′ per day.

Ingersoll-Rand

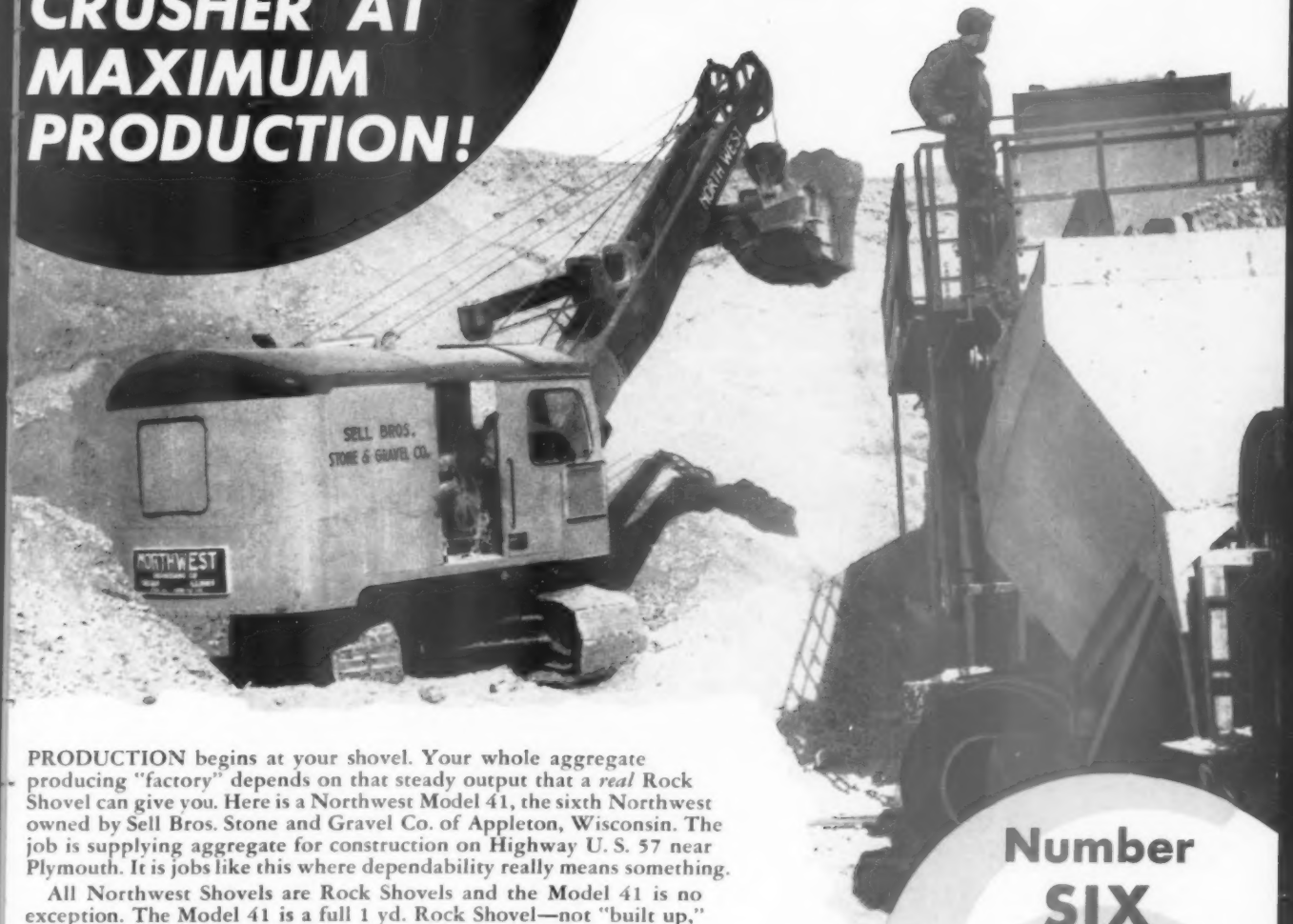
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All Northwest Shovels are Rock Shovels and the Model 41 is no exception. The Model 41 is a full 1 yd. Rock Shovel—not "built up," not modified from another capacity, but built from the ground up as a full 1 yd. rig capable of the output and performance you expect from a 1 yd. Shovel.

Your Northwest Model 41 doesn't waste time! There's no stutter—no restarts—no dipper juggling either in the bank or getting the load in the truck. The cycle is fast and smooth. The "Feather-Touch" Clutch Control makes operation easy. The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. The Uniform Pressure Swing Clutches take hold smoothly—free from jerks and grabs—the dipper is up through the bank and over the truck in a hurry.

These are things that make big output figures!

Here is a machine it will pay to ask questions about. If you need a 1 yd. machine and want a real 1 yd. *built as a 1 yd.* ask a Northwest Man to give you complete details.

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You get both in new 10-YARD Dumptor!



Plus → **PIVOTING SEAT for 2-direction travel**

Operator always faces direction of travel . . . swings around *without leaving seat*. Dual steering wheels, throttle, brake pedals are located at both operating positions of pivoting seat. Directional travel and speed-range lever, and the dump controls are centrally-located for convenient 2-way operation . . . no-turn shuttle hauling.

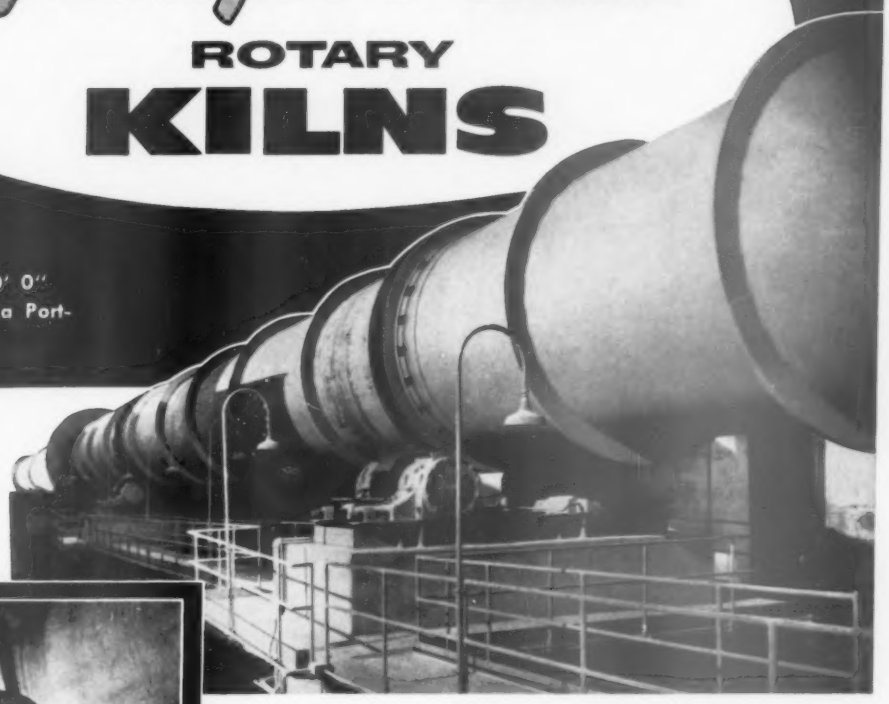
Big things have happened since you last looked at Dumptors. A new, 10-yard Model 100, with 30,000-pound payload capacity, has been added to the Koehring® line. In addition to its dual dumping advantage, and new two-way controls for no-turn shuttle hauling, you also get: speeds up to 20 m.p.h. in either direction • speed-range selections controlled by easy-acting hydraulic clutches • constant-mesh transmission with smooth torque-converter drive • power steering • 28½% gradability, and many more advantages for low-cost, heavy-duty hauling. A smaller, companion-model 6-yard Dumptor® is also available. Why wait? Call Koehring distributor *today!*

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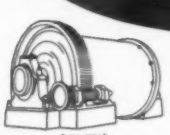
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Traylor

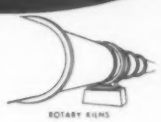
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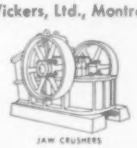
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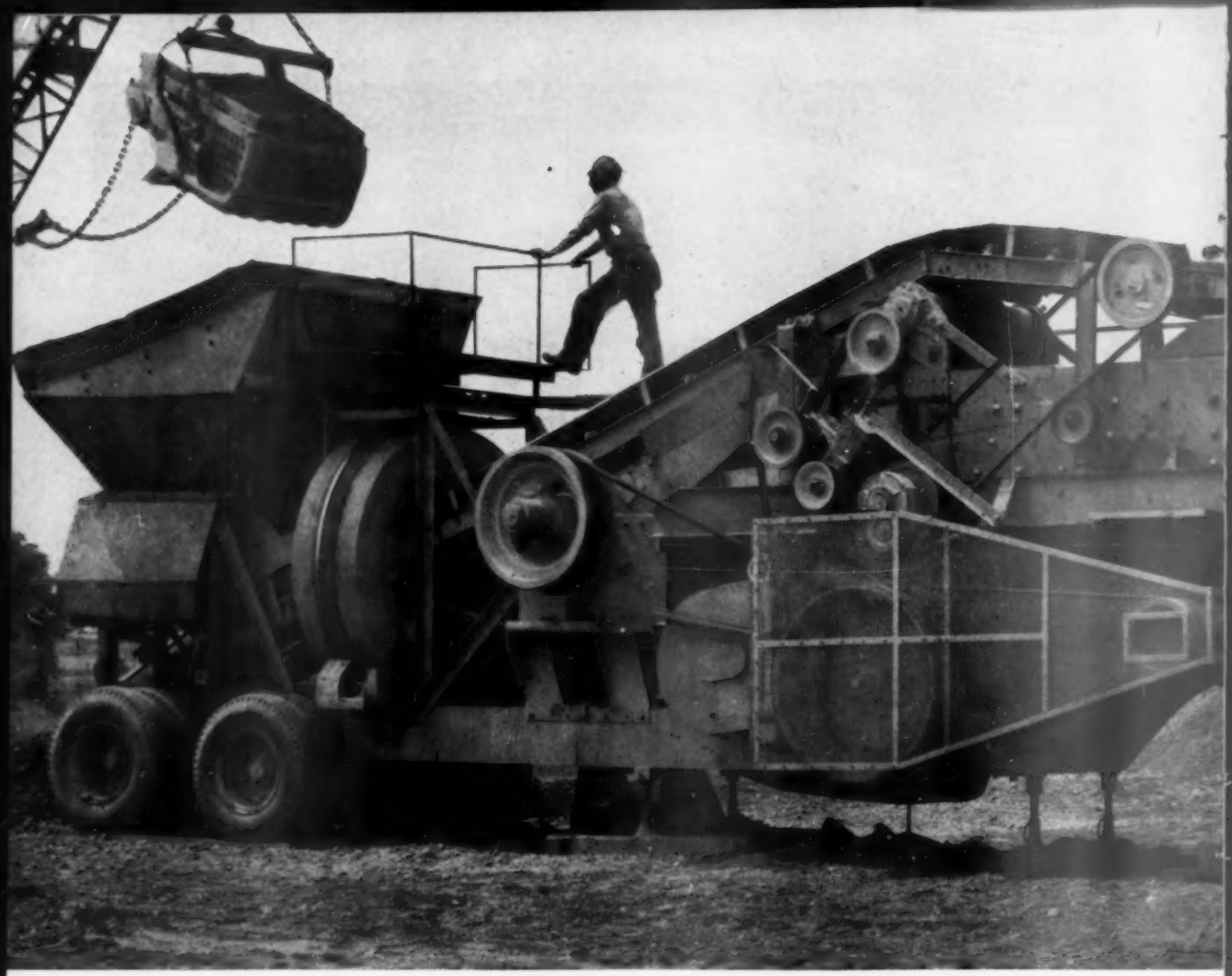


JAW CRUSHERS



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Up-to-date, streamlined lubrication method pays significant dividends in maintenance savings . . .

Texaco Simplified Lubrication Plan

Plan can reduce lubricant inventory and improve lubrication. It can mean more productive manhours, less repair costs, less time lost

If you are using more than six lubricants for your major lubricating jobs, chances are your maintenance costs are a lot higher than they should be. Storage problems, handling costs, and the dangers of misapplication are often costly results of stocking more lubricants than you need.

Texaco Plan cuts number of lubricants needed. Specifically tailored to your operation by your local Texaco lubrication representative, this new plan can cut your requirements down to no more than *six* lubricants for *all* your major maintenance needs. Yet the Plan is simple to put into action; it's quick; and above all, it can save you a significant amount of money.

How the Texaco Plan works

The Texaco Simplified Lubrication Plan is based



Photo courtesy Iowa Mfg. Co.

on a proven combination of multi-purpose and specialty lubricants—varied to meet your particular requirements. For example, multi-purpose *Texaco Marfak Heavy Duty Special 2* might be specified for all chassis, wheel bearing, water pump and other grease lubrication. Its wide temperature range, water resistance, and ability to "stay put" generally make this *Marfak* grease ideal. Then a special application, like track rolls lubrication, would probably be filled by *Texaco Track Roll Lubricant*—specifically designed to protect them against rust and wear. And so on. Your Texaco lubrication representative is well-qualified to go down your list of lubrication needs, to see that your particular operation gets the *best* in modern lubrication with the *minimum* number of lubricants.

Get the full details

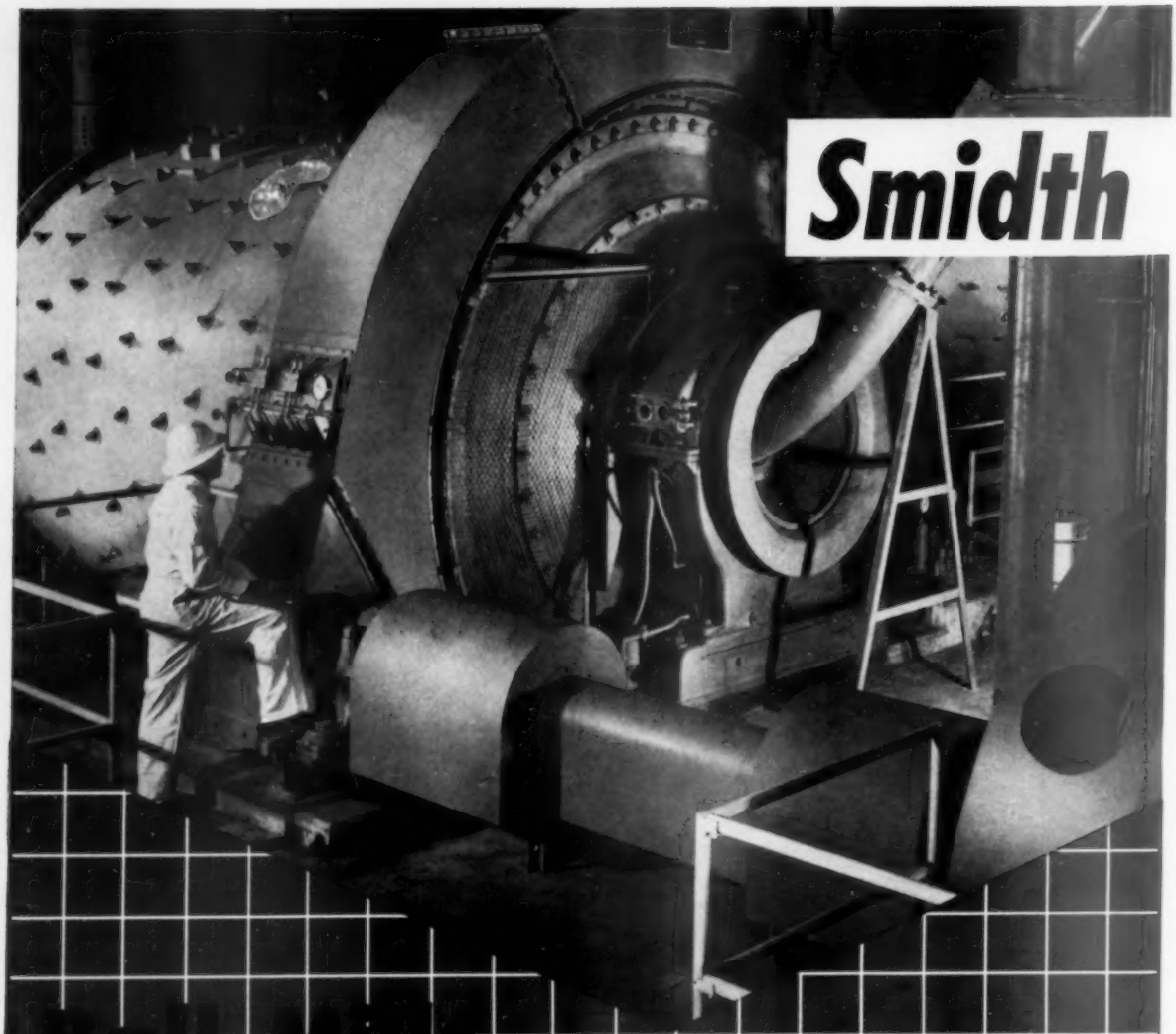
Your local Texaco lubrication representative can give you complete information on the *Simplified Lubrication Plan*. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

October, 1958

Two Harvard scientists have proposed a method for detection of mineral deposits—by pounding the earth with tons of rock. The hammering would be accomplished by a mechanical vibrator driving a platform loaded with rock. The weight would depend on range of check desired. Pounding would produce seismic signals at frequencies from 10 to 100 per second, and the waves would be interpreted by receivers equipped with a new phase-sensitive integrating technique. This enables the operator to ignore any random earth vibrations that might be mixed in with those set up by the transmitter. Their method, say Gold and Menzel, would permit more accurate measurement of vibrations than is possible with present seismic prospecting using explosives.

A tiny camera that goes right down a drill hole to disclose geological formations is being used at the site of the John Day Dam, a U. S. Corps of Engineers project on the Columbia River. The device is the 2¾ in. diam., "NX" bore hole camera recently developed by the Corps of Engineers. Supplementing information provided by the diamond drill core logs will be a continuity of colored photographs, each presenting authentically the depth, orientation and dimensions of every feature of the explored rock. By getting accurate visual data of composition, texture and soundness, engineers hope to avoid foundation problems from bedrock imperfections.

Research to find a plastic grid coating for factory floors led to the development of the new nonskid road paving resin, Guardkote. The Shell Chemical epoxy product is being used on 15 test strips throughout the country. Reports are that it is effective in reducing skidding and that it stands up well under heavy traffic. The coating—applied in ⅛ to ⅜-in. layers—is tough. One of Shell's engineers bonded a steel plug to a concrete road with the resin and could not pull the plug loose with a jack. The concrete broke first.

A drilling platform almost a mile long is being erected seven miles off the coast of Louisiana by Freeport Sulphur Co. Its purpose: to mine sulphur deposits. This type of platform has been used for years in offshore oil well drilling, but this is said to be its first application in sulphur production. The Y-shaped platform will house a water heating plant, air compressing equipment, three drilling platforms, a heliport and living quarters for 250 men. When completed in 1960, the facility will use the Frasch process for liquid mining of the sulphur.

Aerial inventories of stockpiles are replacing ground-level, surveyed inventories of coal supplies at four Public Service Co. of Colorado steam generating plants. With the new photogrammetric method, each survey takes less than one hour's flying time plus 20 hours by one man to compute volume from three-dimensional contour maps. Inventory man-hours have been whittled from 1,000 to 68.

The trend in construction is up, as sharp gains in heavy engineering and residential building indicate that annual totals may exceed the 1957 record levels. Contracts for future construction during the first six months of 1958 totaled $16,788,625,000, only one percent below the comparable 1957 period, reports **F. W. Dodge Corp.**

Total expenditures for construction in July hit $4.6 billion, more than $200 million greater than in June, and $100 million above July, 1957. July spending brought the seven-month total to $26.7 billion, $200 million above the similar 1957 period. Private housing starts climbed to a seasonally adjusted annual rate of 1,160,000 in July, the highest level since January, 1956. Work was begun on 107,300 private dwelling units, up from 104,500 in June and 93,900 in July, 1957.

Strange things are happening. Negotiations are reported between Pennsylvania Railroad and Curtiss-Wright Corp. which could materialize in a high-speed passenger train between Washington and New York, powered by an aircraft engine. Though neither company disclosed status of the talks, **The Wall Street Journal** reports an aircraft company spokesman as saying such a train would be powered by a Curtiss-Wright turbo-compound aircraft engine. The propeller, which has a reversible pitch, would accelerate and decelerate, cutting transportation time appreciably.

Ceramics are being turned out in corrugated and other high surface area structures at American Lava Corp., a Minnesota Mining and Manufacturing subsidiary. Presently produced on a pilot-plant basis, these structures can be used to make heat exchangers, catalyst supports, lightweight structural units and the like. Advantages of using the structures in heat exchangers have been listed by 3M: They could increase the operating temperature range of systems using the exchangers, opening up new applications held back by corrosion and high temperature; they also could make some processes more economical by operating at higher temperatures.

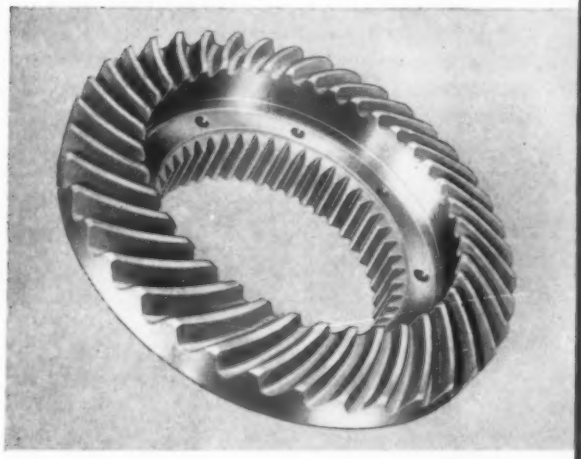
Not yet out of the laboratory is a transistorized portable color television system, developed by RCA. The system, which contains a number of components not yet commercially available, is designed for closed-circuit applications in industry, defense, education and research. It is several hundred pounds lighter than color equipment using tubes and conventional power sources. The camera weighs 20 lb. and the control and monitor unit, only 45 lb.

A cement kiln of mammoth proportions—said perhaps to be the world's largest—has been ordered for the plant in Portugal of Companhia Cimento Tejo from the French firm, Fives-Lille. Scheduled for operation in mid-1959, the kiln will be 17 ft. 6 in. diam. and 546 ft. long. Capacity will be 1,600 tons per day, reports the British publication, **Cement and Lime Manufacture.**

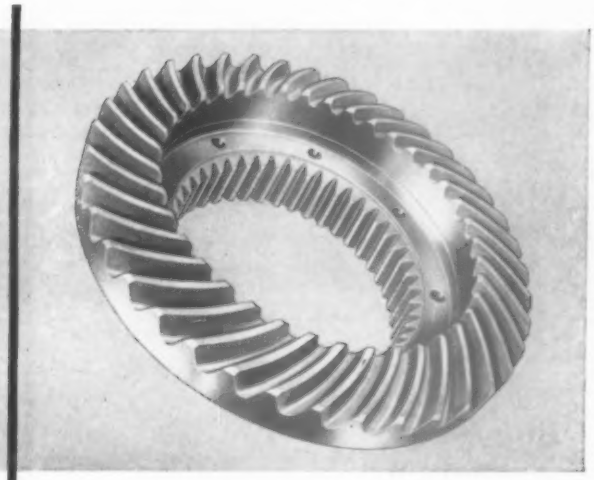
German coal consumers will soon be offered dust-free colored coal, according to research reports from that country. The coal industry is attempting to make its product more attractive to home consumers by dustproofing it with a protective chemical spray. If that doesn't make sales, perhaps coloring will. Blue-tinted coal, coke and briquets will appear first, and other colors are coming.

The editors

They May Look Alike . . . but they're Not!



Replacement Ring-Gear
Made by Eaton—Axle Division



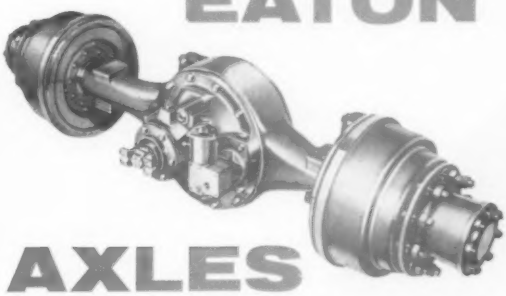
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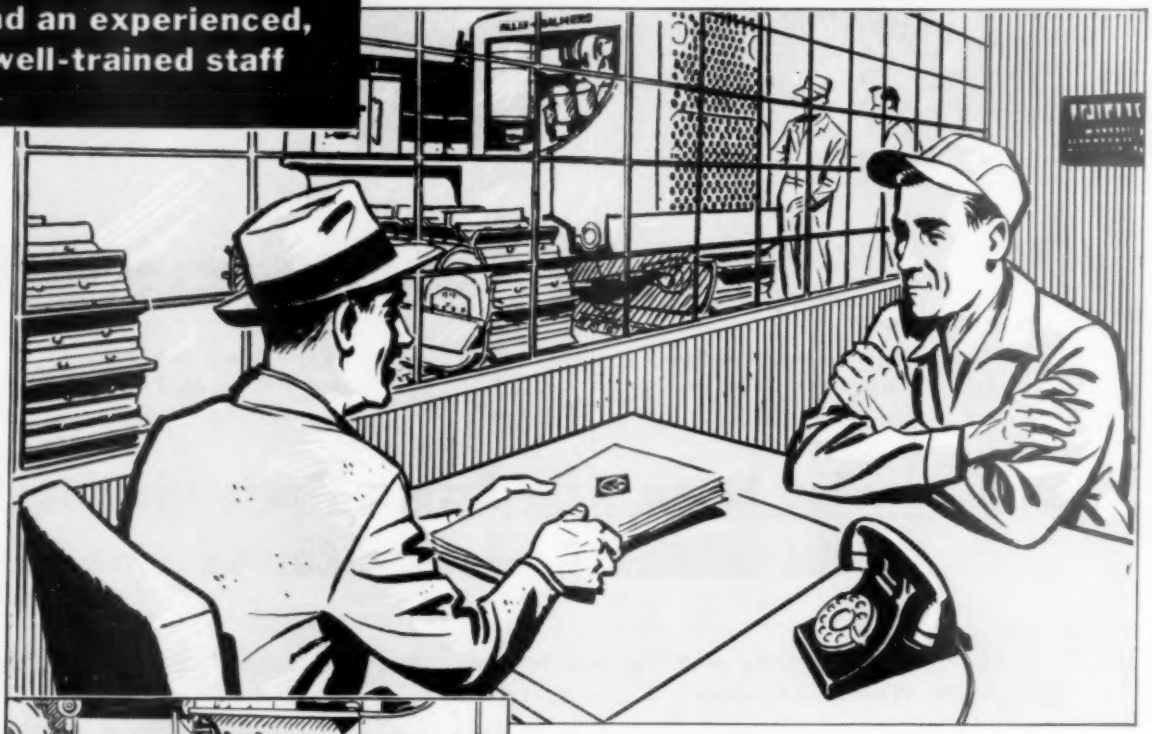
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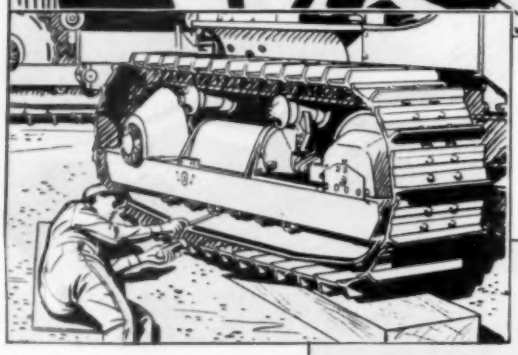
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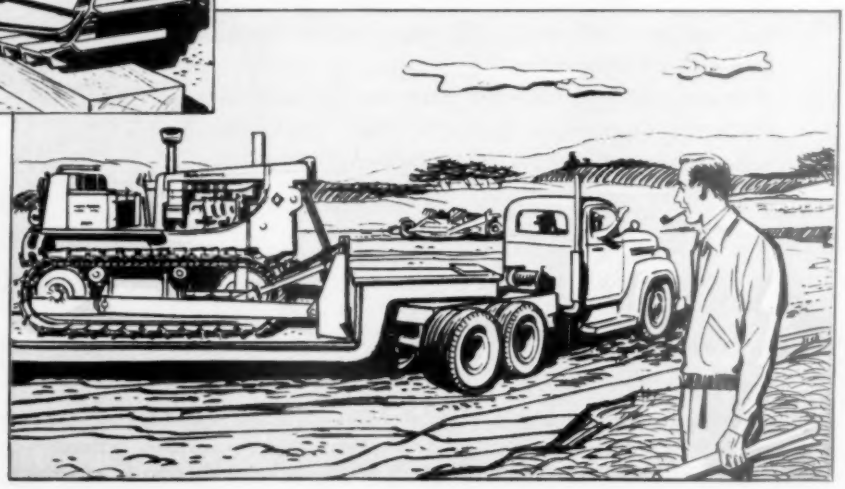
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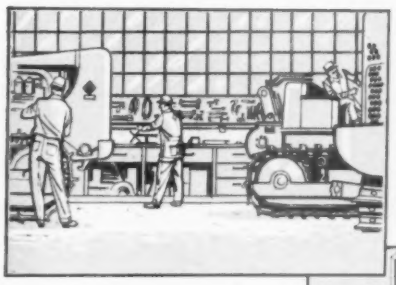


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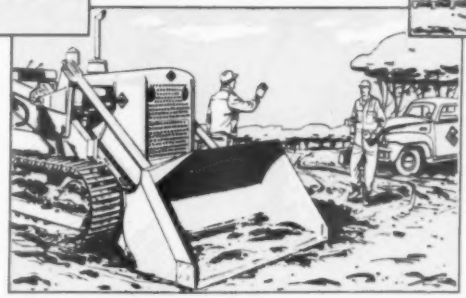
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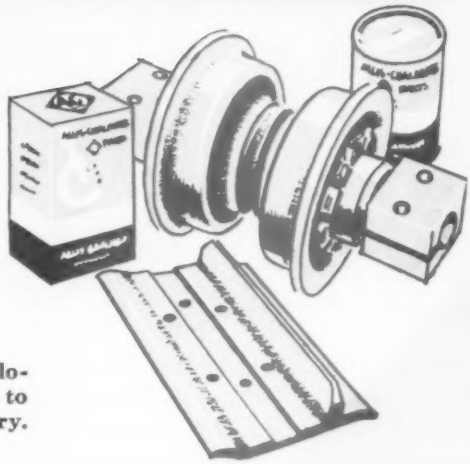
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EDITOR'S PAGE

George C. Lindsay, Editor

Remember the "little" economies . . .

They're important to your business growth

AS A BUSINESS MAN, you should exercise more your obligation to participate in economic development on the state and local level. That obligation is probably more important to you and your business than you realize!

Most of us concern ourselves with economic questions that have been or are to be decided in Washington. We talk loudly for or against federal bills or proposed bills that we know will have some effect on our businesses—and rightly so.

But, aren't we forgetting that—in our grass-roots economy—our national economic growth depends in great part on the growth we help to create in our towns, cities, counties and states? And shouldn't we be more active in that area?

The Committee for Economic Development thinks so, and is calling for concerted action by businessmen to turn their talents and attention to what they call The "Little" Economies. They feel that much of the drag on national economic progress "arises from unsolved problems of local and regional development." Regrettably, the federal government, rather than private enterprise, has taken the initiative in meeting the issue. We need growth, not relief.

That's where businessmen—you—are needed, to help supply sound direction to local economic programs and policies that now apparently are confused and neglected. These policies, good or bad, affect your everyday business and your profits accordingly.

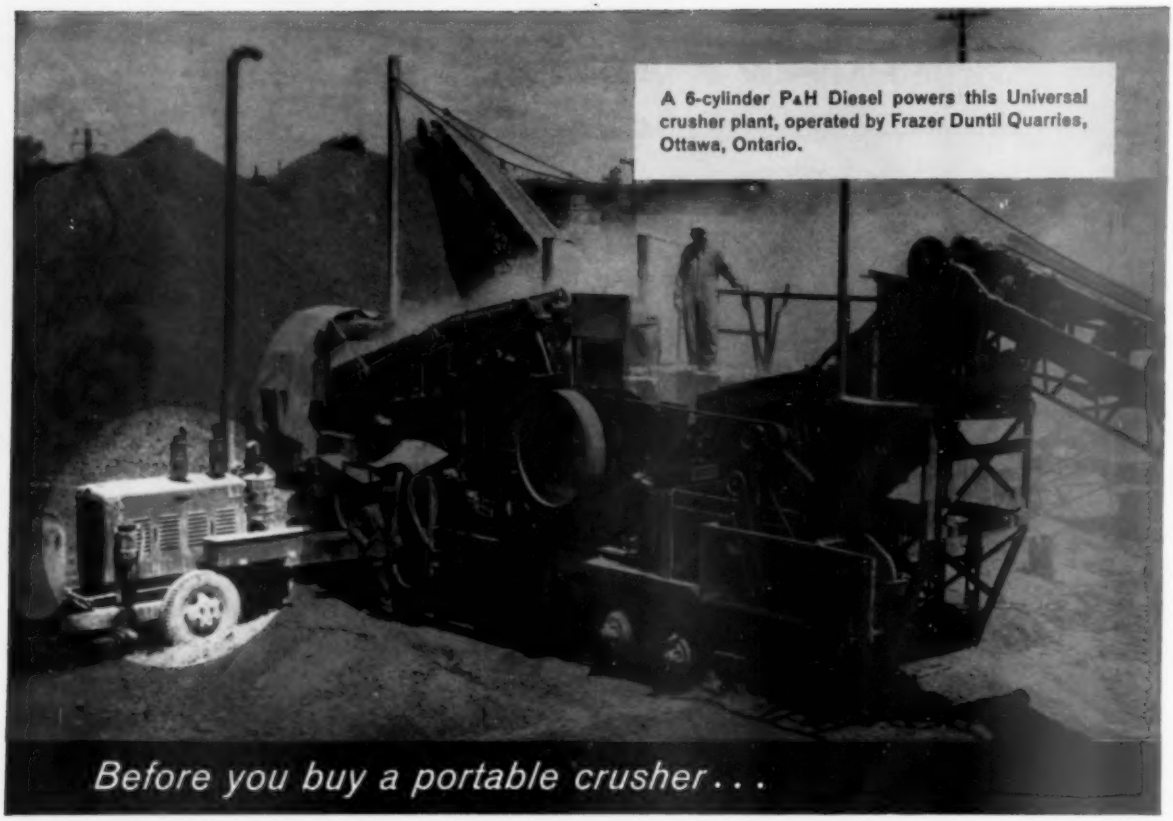
Here's what you have to help plan for:

Economic growth in the next 10 years will represent $600 billion in new construction for new highways and roads, factories, homes, schools, and all associated construction. You'll be amazed to know that comparable real estate existing today adds up to only $500 billion!

The size of the job is fantastic, and it will call for more cement, aggregates and other rock products than you perhaps had anticipated.

Most of the new construction will be in urban core cities—so attention to local development plans becomes paramount. You'll be called upon to help shape those plans and programs.

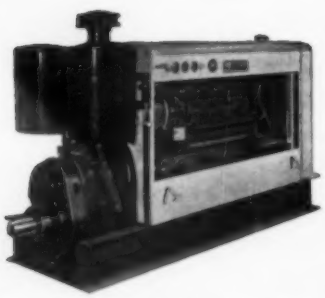
In fact, your own business will prosper or not prosper, depending greatly upon the businessman's (your) participation in directing plans for economic development in your own community and state. Don't leave the job for your federal government.



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ROCKY'S NOTES

NATHAN C. ROCKWOOD



Whose gravel? Legal aspects of "mineral rights"

PROBABLY MOST GRAVEL DEPOSITS are purchased as farm land in fee simple, or the gravel itself on a royalty basis, from private land owners. When the seller, whether a government or some previous private owner, has written into the deed a reservation of "mineral rights," do such mineral rights include sand, gravel or stone to be used as mineral aggregates? The question probably seldom comes up. However, it has come up in Michigan, and there the state supreme court will have to decide.

Today, sand, gravel and stone are quite universally recognized as "industrial minerals." It was not always the case. Hence, "mineral rights" usually referred to more valuable things which may be under the surface, such as anthracite in the hard coal sections of Pennsylvania where many a sorrowing home owner bought a lot without reading "the fine print" in his deed which had reserved all mineral rights to the seller; and perhaps his house and lot sank into a hole before he found out.

The case we are to relate arose from the sale in 1938 of cut-over land in Michigan to a farmer named Matthews by the Department of Conservation of the state government. A generation or two ago, when the lumbermen had denuded the state of most of its forests, the cut-over land was worth little, and the lumber companies allowed much of it to revert to the state by failing to pay taxes. In 1893 the legislature provided for the sale of such land, but only with a reservation of mineral rights. In 1909 the legislature passed an act creating a Public Domain Commission for the purpose of finding buyers for this land, the object of course being to get it back on the tax lists.

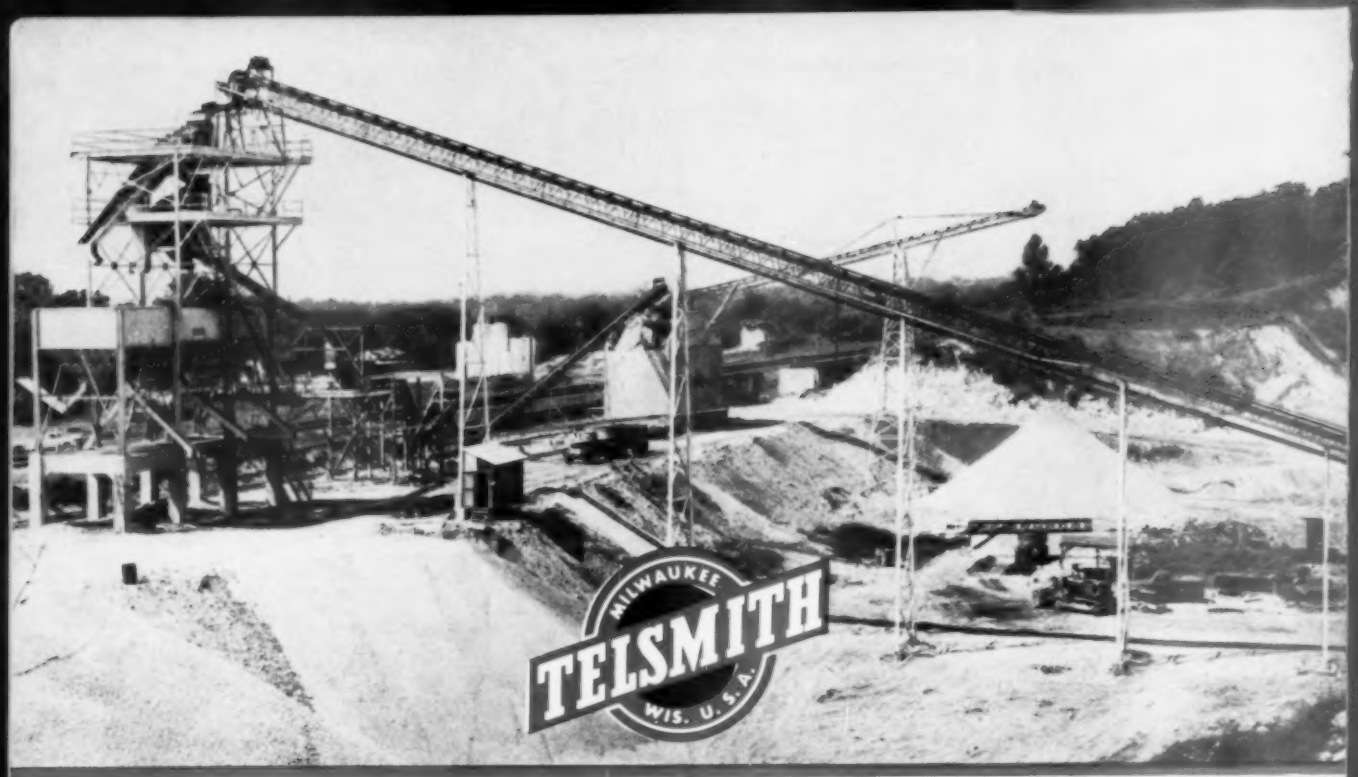
At that time, the state government knew there were extensive iron ore, copper and salt deposits in some parts of the state. Since the land was to be sold at very low prices, the state legislature in creating the Public Domain Commission, provided that: "the deeds by which said lands are conveyed shall reserve all minerals, coal, oil and gas rights to the state and said rights shall be owned by the state; but said commission shall have power to make contracts with private individuals or corporations for taking ore, coal, gas or oil from said lands upon a royalty basis . . ." Various revisions were made in the original law in 1911, 1913, 1917, 1929; but the wording with reference to reservation of mineral rights was not changed. In response to an inquiry in 1940, the then attorney general of the state expressed the opinion that gravel was included in the word "mineral" referring to the state's claims.

Facts in this case: As taken from the brief for the supreme court prepared by the state attorney general the facts are these: The plaintiff, Matthews, made application to purchase the land in dispute in 1938; the application form contained a mineral reservation clause, "pursuant to the provisions of the 1909 act" of the legislature, with an added provision in parentheses that "mineral rights include sand and gravel." The plaintiff was thus fully informed regarding the conservation commission's claims.

Years later the commission discovered that the plaintiff (farmer Matthews) had been selling gravel from the land (about 54,000 cu. yd. in all) for which he had received $4,350. This was easily determined because the gravel was sold for highways either directly to county authorities or to a highway contractor for county work. Hence, the conservation commission demanded the $4,350 as belonging to the state.

The plaintiff Matthews in his correspondence with the commission admitted his mistake and agreed to make restitution by giving the state an equivalent amount of gravel from some other part of his property where there were no entanglements. However, he failed to find any other suitable gravel, and was unwilling or unable to make restitution in cash. In this extremity he apparently

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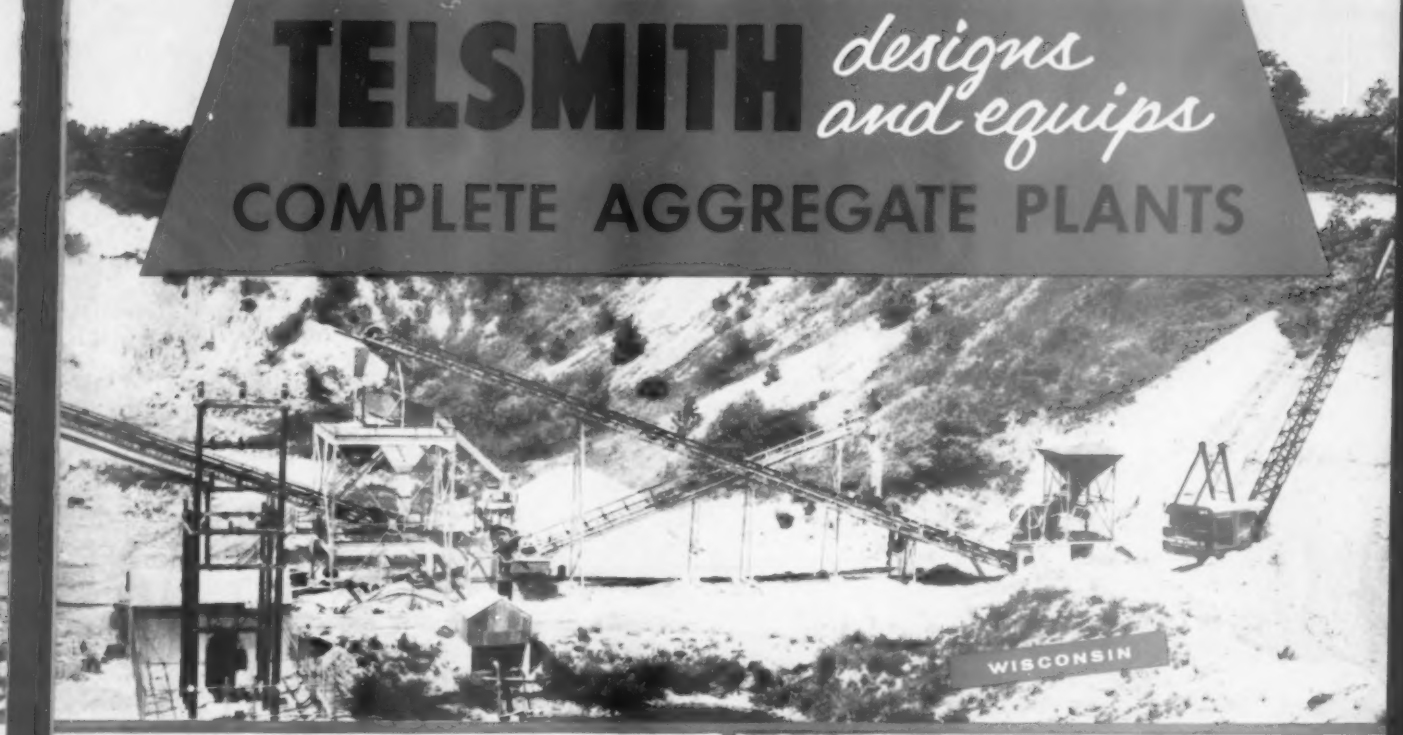

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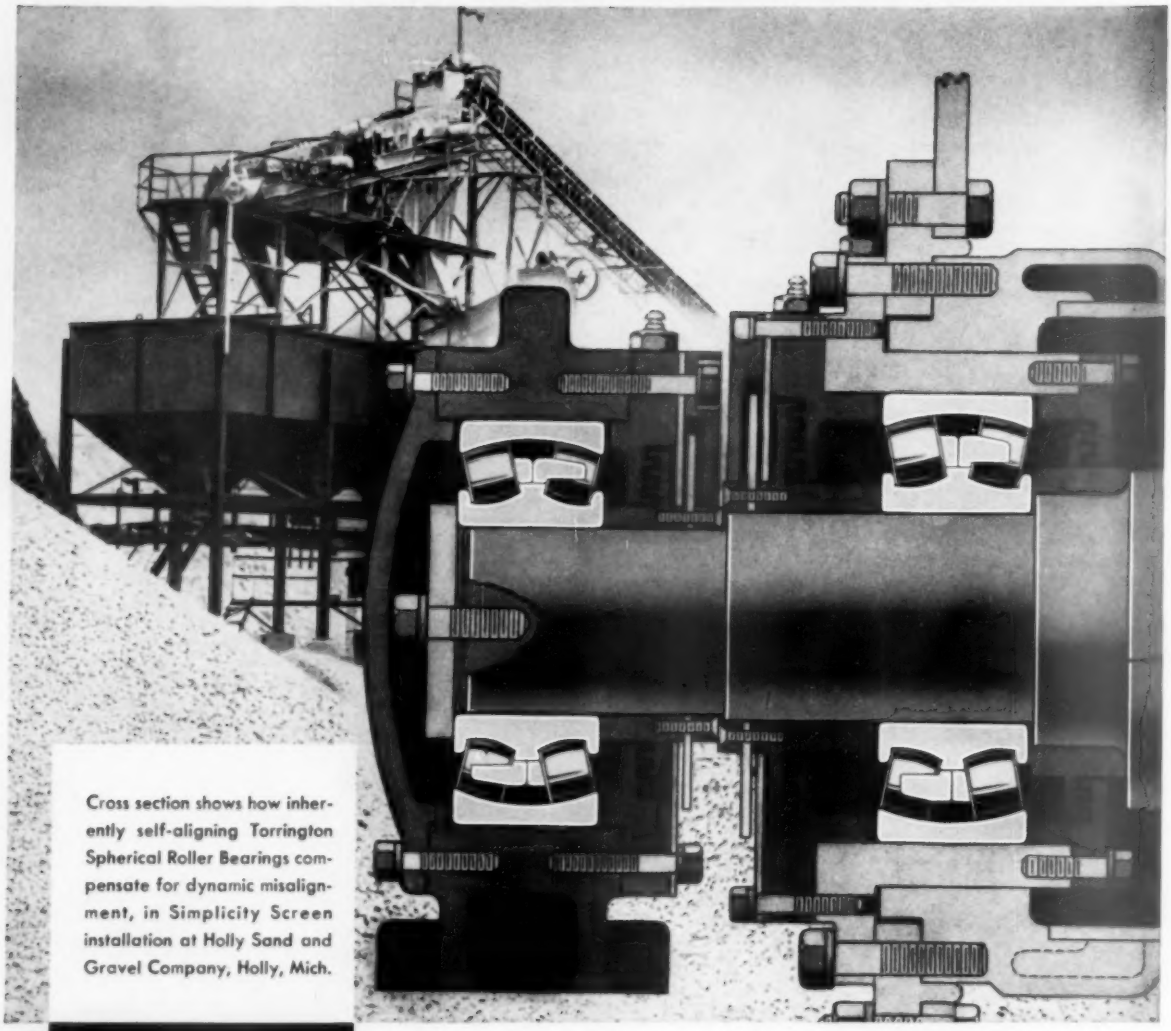
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Washington Letter

Edgar Poe

Welfare State Continues

The Democratic-controlled 85th Congress closed with the tide still running strong toward the "welfare state." The lawmakers broadened the social security benefits which means bigger payroll deductions for the employe and more taxes for the employer. Congress, among other things, did these things that affect the rock products industries: Ended the three percent tax on freight, provided more mortgage money for home building, made the Small Business Administration a permanent agency, gave small business a tax break, appropriated $1,188,000,000 for public works.

Also: provided for an acceleration in the great highway construction program, authorized more than $1 billion of new rivers and harbors projects, appropriated some $72 billion, increased the postage rates, and provided statehood for Alaska.

With Senate and House members home, many of them to electioneer, indications were that it would likely be a long time before there would be a general tax cut for individuals and corporations. Indications are that many people may be paying bigger taxes before the tensions of the world ease. Even with an ease in the world situation, Congress has discovered that spending is more popular than saving and cutting taxes.

Congress Lacked Courage

This being election year, labor legislation bogged down on Capitol Hill. Congress lacked courage to put a restraint on big unionism. The only significant measure to become law requires employers and labor unions to publicly disclose their pension and welfare funds that run into hundreds of millions of dollars. The measure is intended to throw safeguards around the funds which the working men and women of this country have contributed through the unions.

When the House killed the "soft" Kennedy-Ives labor legislation, it meant that major labor legislation was postponed until next year at least. Labor is powerful in the Congress of the United States. It received some temporary setbacks from the actions of the Dave Becks, the Jimmy Hoffas and numerous other so-called labor leaders. However, the unions are making a concerted effort to elect more members of Congress and members of state legislatures in the November election.

There have been no major changes in the Taft-Hartley law since its passage in 1947. Many neutral observers are hopeful that for the good of the country labor reform legislation will carry effective prohibitions against secondary boycotts that now flourish under the Taft-Hartley law. There is also an acute need of strong prohibition against "blackmail picketing."

President Eisenhower expressed disappointment that Congress failed to enact legislation designed to curb racketeering, corruption and abuses of trust within the big unions. At the same time the President and Secretary of Labor Mitchell have indicated that the administration will make a series of labor reform recommendations in the next Congress. The President has emphasized that the secondary boycott provisions of the Taft-Hartley law should be tightened to protect all employers and individual employes from unfair coercion, and to deal forcibly with the "hot cargo" situation. The administration also proposes that a Commissioner of Labor Reports, a new office, be created within the Department of Labor. All unions would be required to file full reports on their activities with the commissioner.

Contractors Leasing Equipment

Many contractors have advised the House Ways and Means Committee that they are finding it more economical to lease their equipment and machinery these days. The existing depreciation schedule is unfair and outmoded. Therefore, more and more contractors are leasing machinery because Uncle Sam permits contractors to deduct all leasing charges. Another advantage is less borrowing from the banks to make down payments on machinery.

Small Business Relief

One of the provisions of the small business relief bill passed by Congress at the recent session is one that permits the writeoff for tax purposes of 20 percent of the cost of machinery and equipment in the year of purchase. However, the acquired machinery and other tangible property must have been made in 1958 or thereafter, and it must have a useful life of six years or longer. The fast writeoff is limited to $10,000 investment per year for a taxpayer making a separate return. In the case of husband and wife filing a joint return the writeoff limit is $20,000 a year.

Reckless Spending

Said Senator Harry F. Byrd, independent Democrat of Virginia, and watchdog of the United States Treasury: "This has been probably the most recklessly spending session in the history of the American Congress."

Market Delays some Construction

Weakening of the bond market has caused many communities and state agencies to postpone building of community facilities until the market improves. The U. S. bond market which began to sag in June steadily declined into late summer because of the inflationary psychology. People everywhere obviously felt that stocks were better buys than bonds whether they were federal, state, local or corporate bonds. The outlook of a possible federal deficit of $12 billion at the end of the current fiscal year means that Uncle Sam is going to be required to make fairly frequent trips to the money market, thus competing with private corporations.

Eight Billion In 1962

Spending on highways—federal, state and local—will jump to $6.2 billion for 1958, but spending by all levels of government will increase to $7.1 billion in 1959, $7.3 billion in 1960, $7.7 billion in 1961 and $8.1 billion in 1962.

Dividends In public Works

A tremendous amount of rock products will be required in the huge public works program that Congress provided. As finally approved, the Public Works Appropriations bill carries with it $1,118,000,000. Senator Allen J. Ellender, Democrat of Louisiana, chairman of the Senate Appropriations Subcommittee that conducted hearings on the bill, said: "Unlike the billions of dollars the American taxpayers are throwing away in foreign aid, the public works projects provided under this bill will yield the American people a substantial dividend over the years."

No cement Shortage Looming

Department of Commerce experts say there is nothing looming on the economic horizon to indicate there will be any kind of a cement shortage for the next four or five years. Increased capacity in the industry will provide for all foreseeable needs for a few years. On the other hand, some local shortages could occur due to transportation or some specific localized condition.

Hundred Thousand Barrels

The Commerce Department believes that cement requirements for highways, totaling about 60 million barrels in 1955, will rise to about 110 million barrels by 1961. By the end of 1955 the annual capacity of the industry was about 311 million barrels. By 1957 it had climbed to 380 million barrels, and by 1960 or 1961 the capacity of the industry will be approximately 400 million barrels.

Construction Near record

Economists in the nation's capital generally agree that the business news continues good into the autumn. Construction activity this year has been about the same as record-smashing 1957.

Farm People Leaving

Although the rural population in the United States is at an all-time high, the farm population continues to decline. The Census Bureau says about 20,827,000 people were living on farms this year, a decline of 4,231,000 or 16.9 percent since April, 1950. In 1910 about one out of every three persons lived on the farm, as compared to one out of every eight in 1958.

Highway Directory

The American Road Builders Association has issued its 1958 edition of the Directory of State Highway Officials and Engineers. The pocket-sized book, bearing the names of more than 1,700 state highway officials, engineers and administrative personnel of the Bureau of Public Roads and toll road authority executives, costs $1. ARBA is located in the World Center Building, Washington 6, D. C.

END

Roebling Presents

THE NEWEST CONCEPT IN WIRE ROPE

*Herringbone**

two ropes in one!



Here is a combination that has proved itself during three years of field testing. A welcome addition to Roebling's great line of wire ropes, Royal Blue *Herringbone* is both a regular lay and lang lay wire rope!

So, in one rope you have the greater flexibility and abrasion resistance of lang lay construction *plus* regular lay's superior stability under severe operating conditions.

Preformed Herringbone is made of two *pairs* of lang lay strands, and two strands of regular lay which separate the two pairs of lang lay—all of it made of Type 1105 rope wire.

For three years Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. Without reservation, its performance has been superior to that of any other rope used for the same jobs . . . even in the hands of inexperienced personnel! *Its proven capabilities clearly suggest its use for all jobs where steel core ropes are normally used.*

See your Roebling salesman for all the facts or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Roebling Herringbone, the two-in-one rope to meet the *doubly* stringent demands of today's economy.

**Reg. app. for*

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

HERRINGBONE
WIRE ROPE

Enter 1450 on Reader Card



Quarries reduce hidden costs by operating with Gulf fuels

GULF MAKES THINGS

The cost of operating your equipment is high enough. But when a quarry runs into the hidden costs of unnecessary downtime and below par performance—the odds are great that it's a fuel and lubrication problem.

The quarries that operate with Gulf fuels and lubricants report sizable reductions in downtime and repairs. They find their equipment keeps working longer, more efficiently, with fewer overhauls. They know Gulf makes things run better . . . operation-wise and cost-wise.

For example: Gulf gasoline and diesel fuels burn clean —help prevent harmful deposits that clog fuel systems, injectors, or cause sticking valves and rings. Gulf lubricants guard against excessive friction and wear.

Whatever equipment you operate . . . truck, shovel, crusher, conveyor, kiln . . . Gulf has a fuel to power it most efficiently, and a lubricant to protect its moving





North American Cement Corporation, Howe's Cave, N. Y., is another leading firm that gets top equipment performance with Gulf fuels and lubricants.



Tecon Corporation of Dallas, handled a major quarrying operation on the St. Lawrence Seaway Project. LeRoy Ramer, Tecon Project Manager reports: "In two years with Gulf we didn't have a single case of engine trouble."

Linwood Stone Products Company, Davenport, Iowa, uses Gulf fuels and lubricants in all their trucks, shovels, crushers, conveyors, kilns. This company tripled lubricant life when they changed to Gulf.

and lubricants

RUN BETTER!

parts. You get more work out of your equipment when you go Gulf.

Make sure *your* hidden costs are kept to a minimum. Use Gulf fuels and lubricants, and see how Gulf makes things run better. Just call the Gulf Sales Engineer at your nearest Gulf office. Meanwhile, mail coupon for 88-page "Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send copy of your new "Contractors' Guide"

Name _____

Title _____

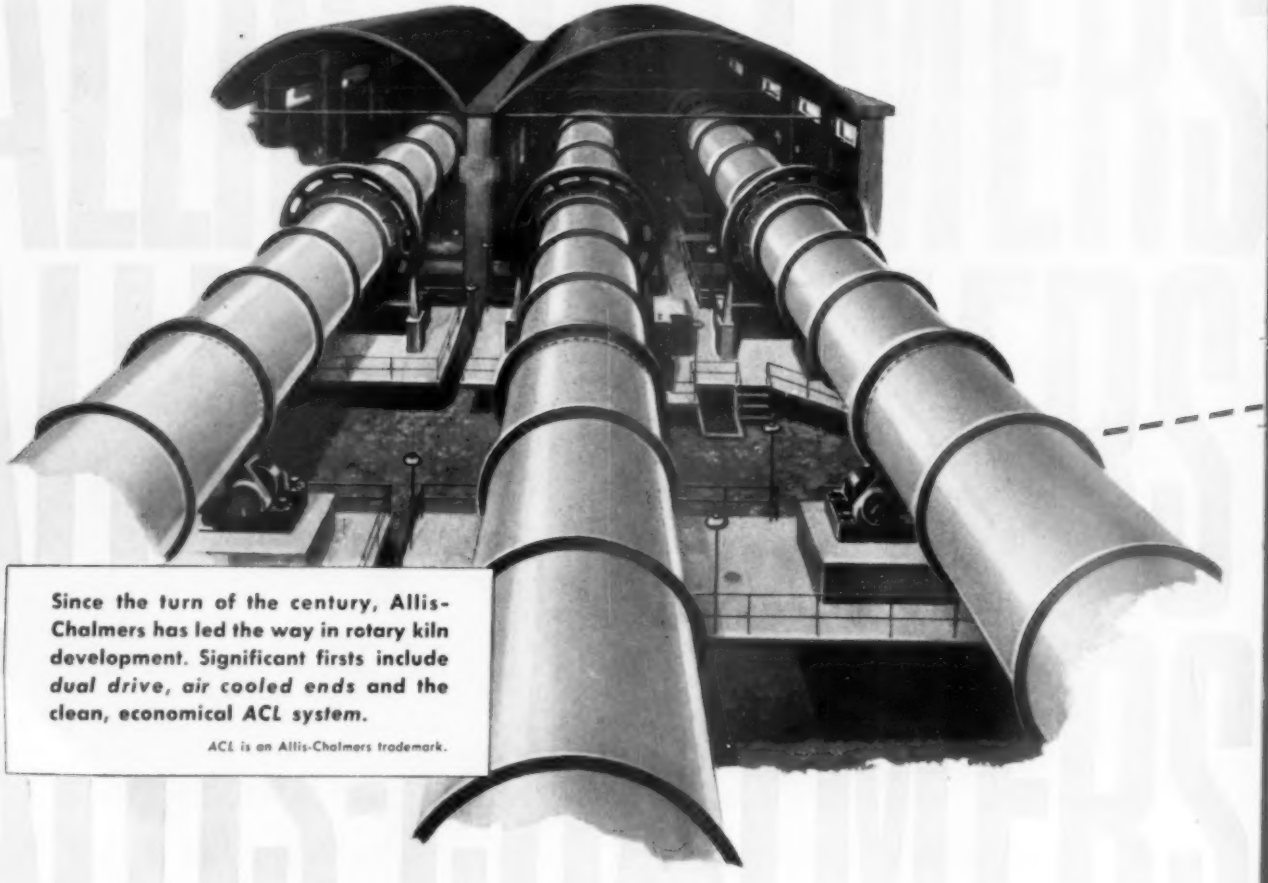
Company _____

Street Address _____

City _____ Zone _____ State _____

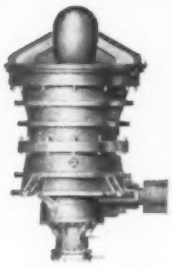
Enter 1531 on Reader Card

Specialized Equipment for Every Industry

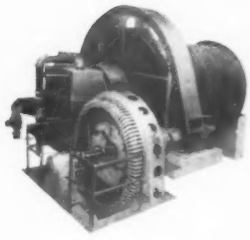


Since the turn of the century, Allis-Chalmers has led the way in rotary kiln development. Significant firsts include *dual drive, air cooled ends* and the clean, economical *ACL system.*

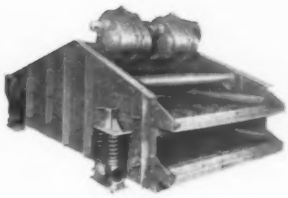
ACL is an Allis-Chalmers trademark.



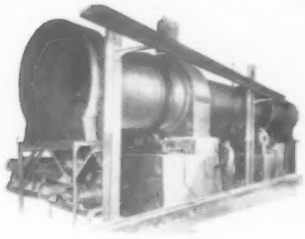
Gyratory Crushers



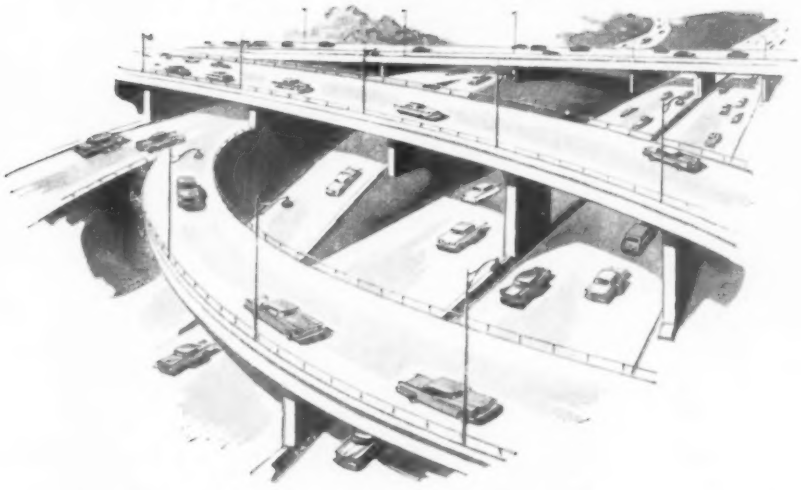
Grinding Mills



Vibrating Screens



Dryers, Coolers





Only from Allis-Chalmers

Processing machinery and matched electrical equipment for top efficiency in cement making

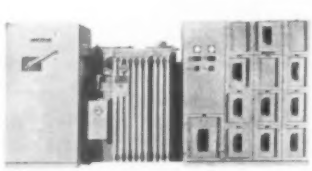
More than 50% of domestic cement is produced with A-C kilns, crushers, mills and screens. Allis-Chalmers is also one of the largest manufacturers of electric power equipment. No other company has this combination of equipment, or the vast experience in coordinating all this equipment for the ultimate in efficient operations.

Help for You and your Consultants. Before equipment recommendations are made, requirements and variables are studied carefully. An Allis-Chalmers team of research, design, manufacturing and application specialists from various processing and electrical equipment departments look into every phase of your operation. All technical conclusions are correlated in one department specializing in cement industry application. Finally, equipment is matched to meet all the requirements for top-efficiency operation. Then Allis-Chalmers assumes sole responsibility for *maintaining* efficiency.

Ask your A-C man to arrange a meeting with an A-C cement team. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



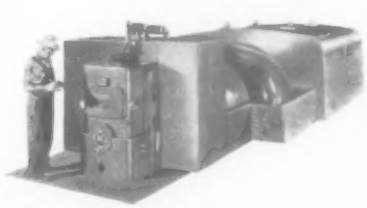
Motors



Unit Substations



Control



Steam Turbines

ALLIS-CHALMERS

A-5770

How would you decide?

A round-up of actual day-to-day in-plant problems and how they were handled by management men

If an employe resigns, can he get his job back?

What Happened: One of the employes, named Bill Dusa, came up to his supervisor one day and said: "I just found another job for more pay. I'm giving you two weeks' notice." The supervisor replied: "I'm sorry you're leaving. I hope you will be happy there. By the way, why don't you put your resignation in writing so I'll be able to clear things with the payroll department?" Dusa did this. A week later Dusa changed his mind, and asked to have his letter of resignation rescinded. The company refused on the grounds that Dusa had resigned and could not claim his job back without management's consent. Dusa argued differently:

1. A letter of resignation is not effective until the "notice date" expires. My letter still had three more days to go.
2. The company did not replace me, nor did it post my vacancy, so it lost nothing.

Was Dusa:
Right? ☐ **Wrong?** ☐



What Arbitrator Dworkin ruled: "In this particular case, the evidence raises no doubt but that the grievant tendered his resignation, and the notice given to the company was intended to convey the employe's intention to sever his relationship. The company did "accept" his resignation. The employe having quit his job, the attempted reversal cannot be unilaterally made. The arbitrator views this case as one of simple and voluntary resignation. The grievance is denied."

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to *Rock Products*.

Can you fire an employe for a violation of rules if you have excused others for the same offense?

What Happened: While making his rounds in a remote part of the building, the night foreman heard the gentle tinkle of a bell in the room on his right. He tried the door—and it was locked. A sleepy-eyed worker opened the door when he knocked. He had his shoes off, and in the corner was a nice cozy blanket and pillow. He was immediately fired for sleeping on the job.

He took his case to an arbitrator. He said: "Yes, I was sleeping but I don't deserve this kind of punishment. Last month two janitors caught sleeping got a three-day layoff."

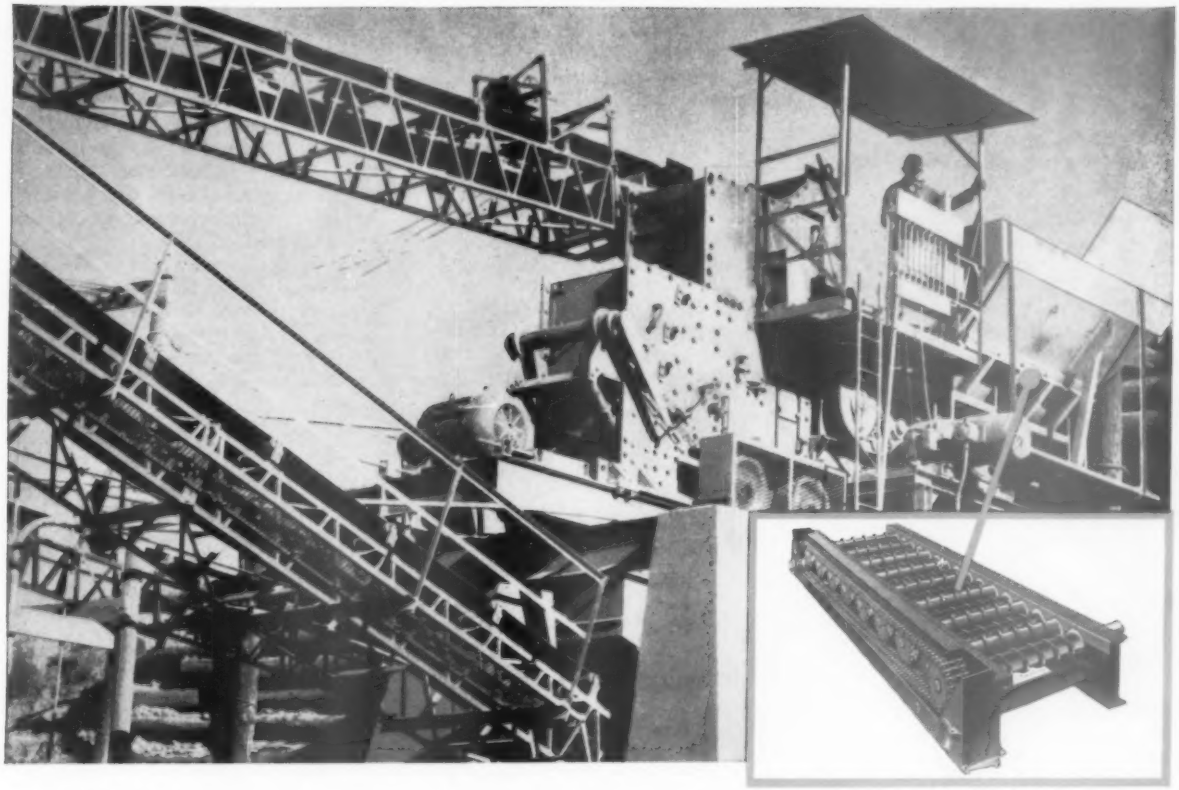
The company was not caught napping by this argument:

1. This man had a responsible job and he did not carry out that responsibility.
2. He probably slept all the time.
3. We didn't fire the janitors, but look at the difference in the responsibility of the jobs.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Updegraff ruled: "An employe sleeping on the job is subject to discipline. An employe who deliberately makes advance arrangements for sleeping deserves severe discipline. The company's action in discharging this man was not too severe."

(Continued on page 32)



"A Universal plant made aggregate production a profitable addition to our business."

says Ray Mast, Superintendent, Mullet Coal Company, Mount Eaton, Ohio

"For the past twelve years our company has been producing industrial coal at the Mount Eaton site. To mine the coal, we have to blast through a four-foot layer of limestone. Because of a growing demand for aggregate in this area of Ohio, we decided to expand our operation and make use of the limestone.

"In our quarrying operation, overburden is first stripped off, exposing the limestone floor above the coal. A tractor and broom sweep the surface clean for drilling and blasting. Between the limestone and coal is an intermediate layer of clay, dirt and mud. When blasted, this material mixes with the limestone to form a compound containing as much as 30% of objectionable fines. Our problem was to get rid of the fines before crushing the material to specification road stone.

"A highly satisfactory solution was found by using a Universal Wobbler Feeder ahead of our Universal Impact Master.

"Our Wobbler Feeder, a 9" pitch unit, has 16 bars composing a 36" wide bed at the bottom of the hopper. The bars, elliptical in shape and set at alternate vertical and horizontal positions, are spaced 2" apart. Ten-ton quarry loads are dumped on the feeder bed. As the bars rotate, the load is moved forward. The 2" and under material is scalped off ahead of the crusher and drops through the bar spacings. These unwanted fines are discharged to a waste pile by a reject conveyor. The oversize is fed to the Impact Master for reduction to specified size. The crusher functions as a primary and secondary by closed-circuiting with a screening tower."

This feeder-crusher combination was featured by Universal at its exhibit in Chicago during the January, 1957 Road Show. Since that time a number of these plants have been put into operation throughout the country. Mullet Coal Company is just one of these applications.

We'll be glad to tell you where they are and how they work and just what the Wobbler Feeder-Impact Master combination can do for you. Tell us the kind of material to be handled, the percentage of fines in the feed, size of fines to be removed and desired capacity in tons per hour. We'll furnish complete information at no obligation.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION

617 C Avenue, N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Enter 1422 on Reader Card

LABOR RELATIONS

continued from page 30

Can you fire an employe for violating a rule which hadn't been enforced for 20 years?



What Happened: Carl X was caught writing on a wall in the company locker room. When questioned, he freely admitted that he was a "bookie." He was immediately fired. Carl thought that the company's action was very unfair. He filed a grievance and when the company refused to reverse the supervisor's action, the case went to arbitration. Said Carl:

1. Bookmaking had been going on in the plant for 20 years, and even though there was a company rule against it, the prohibition had never been enforced.
2. I should have been warned first, and if I repeated — then discharge would be warranted.
3. And besides, I was a good worker. I "made book" on my own time. Who was hurt? Nobody!

Was Carl:
Right? ☐ **Wrong?** ☐

What Arbitrator Cahn (chairman) ruled: "We hold that the fact that an illegal practice has gone unpunished for a long period of time cannot be said to stop the company from attacking this practice in the future. Certainly the practice of an illegal act over a long period of time cannot be said to result in the establishment of a 'local working condition.' An employe who, while on company property, performs an illegal act ('writing numbers') is not properly discharging his responsibilities as an employe. Such discharge of responsibilities must imply conducting oneself in a lawful manner while working as an employe. The fact that the grievant may have been on his lunch hour or may have used an open public pay telephone in performing this illegal act is irrelevant. For during all times that an employe is on company property, he must conduct himself properly: he may not engage in illegal activities whether he does so on his 'free time' or not in order to further his illegal actitvities. The discharge was for just cause."

If an employe leaves his job and goes home, can the company assume he had quit?

What Happened: Phil Clark and Charlie Lang got into the habit of changing jobs in order to relieve the monotony. When the supervisor found out he told them to cut out the practice. The next day, he found that they were back at their old tricks. He told Clark and Lang to "do as you're told or stop working for this company." The two men left their jobs, punched out, and went home. The next day they showed up for work.

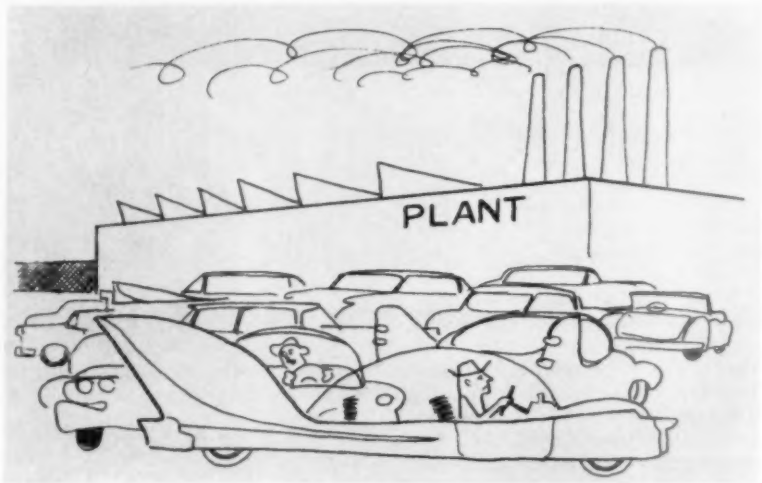
The company claimed that the men, by going home, had indicated that they had quit, and they were not entitled to their jobs back. Nor were they entitled to other benefits like accrued vacation, which they would get if they had been fired.

The men claimed that they were so upset by the supervisor's bawling-out that they thought he had fired them. Upon thinking it over, they decided that maybe they were not fired, and therefore they ought to come back to work.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Updegraff ruled: "These men did not quit, neither were they discharged. Because they walked off the job without permission, they are subject to discipline. I order reinstatement, but without back pay."

Must employer supply parking space for employe?

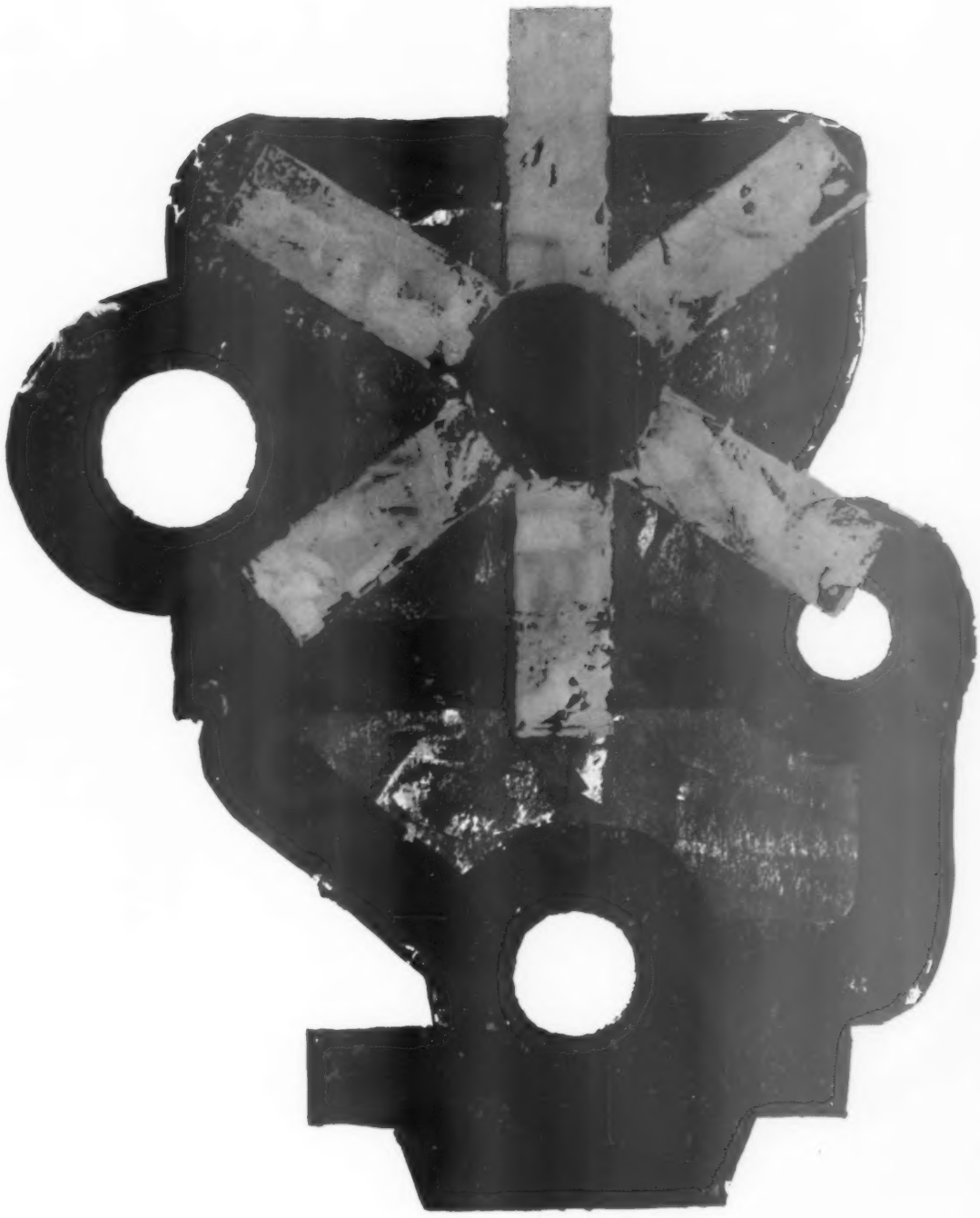


What Happened: When the police department started cracking down on street parking, and gave out lots of tickets, the employes of the company demanded that they be provided with a parking area inside the plant gate. In fact, they went ahead and filed a grievance to that effect. The management refused to process the grievance on the grounds that the demand for parking space had nothing to do with wages, hours or working conditions. To prove its point, the company agreed to have an arbitrator decide the matter. The employes claimed that their wages were affected because when they had to pay parking fines, their "take-home-pay" was less. They also claimed that their safety was in jeopardy because congested streets outside the plant made crossing into the plant hazardous.

Were the employes:
Right? ☐ **Wrong?** ☐

What Arbitrator Clarence Shipman ruled: "Without minimizing it one iota, the arbitrator must dismiss the grievance. As the company correctly points out, he has no jurisdiction in the matter. He can only act where the Agreement establishes an obligation upon the company. Where, as here, the Agreement does not make it obligatory upon management to take the particular action which the union is seeking, the grievance then stands without Agreement support and must be dismissed."

END



CONTRACTORS: SPECIFY YOUR POWER →

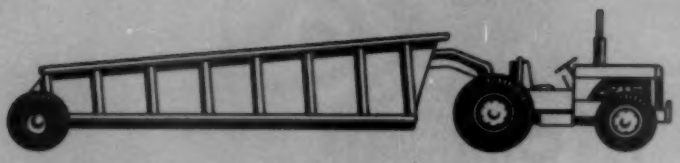
STANDARDIZE ON CUMMINS

MORE THAN 300 MODELS of construction equipment are available with Cummins power!

FUEL COST SAVINGS alone will be as much as 50¢ per operating hour!

CUMMINS POSITIVE DIRT PROOFING SYSTEM adds years to the life of the engine!

CUMMINS FIELD SERVICE availability insures 'round the clock operation!



BOTTOM DUMP

Size	Autocar	Euclid	Kenworth	KW-Dart	Le Tourneau Westinghouse
16 Yds. (Struck)					C
17 Yds. (Struck)		28TDT-122W			
25 Yds. (Struck)		33LTD-132W			
35 Yds. (Struck)	AP-25T			70 BDW	
COAL HAULERS					
25 Tons		76FDT-121W			
40 Tons		33LDT-133W			
50 Tons	AP-25T			50S-BDT	
51 Tons		24TDT-128W		70S-BDT	
70 Tons			803-T		

TRACTOR-SCRAPERS

Size (no. yds. heaped)	Clark	Euclid	I.H.	Le Tourneau Westinghouse	M-R-S	Wagner	Wooldridge	Westfall
5.7						IND-6		
9						IND-9		
10.5	110							
12						IND-14		100
13			2TS5					
16		76DT-185W						
18				C				175
19	210							
21			2TS5				CW-215	
25		28TDT-365W			125	IND-24		
26								Performer
27				B	150		CW-320	
29	310							
32		33LDT-325W			190			
41.5					200			
48					250			



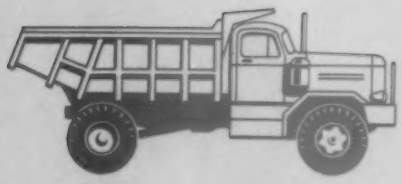


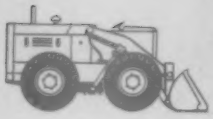
CRANES

Size (tons)	American Hoist	Baldwin Lima	Bay City	Dominion	Gar Wood	Insley	Le Tourneau Westinghouse	Link-Belt Speeder	Marion	Orton Crane	Thew
5										3E-UDT	
7.5										6E-UDT	
10										8E-UDT	
15										12E-UDT	
20		34, 25-T			75BT		C			16E-UDT	
21									35-M		
25		34-T, 34-TS, 44	600		100BT			HC-88	35-MTC	22E-UDT	
27									43-M		
30		44-T	720				B	HC-98	37-MTC		SP-530
32										26E-UDT	
35		54-T 604 703		400		WB		HC-108			MC-530 (Both MC-503 Carriers TSP-530W and Turntables)
40	505C	64							43-MTC	32E-UDT	
43									362		
45						WB					
50		64-T, 64-SC, 703-SC, 803								42E-UDT	
60				550							
70		1201, 84-T									
75									87-M		
80									93-M		
84									101-M		
85		1250									
100		1250-SC									
168									111-M		

REAR DUMP TRUCKS

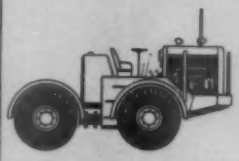
Size (tons)	Autocar	Euclid	I.H.	Kenworth	KW-Dart	Le Tourneau Westinghouse	Mack	Oshkosh	Wooldridge
10					10S				
15	AP-15	80FD			15SL		LRX		
18		94FD	PH65	801					
22		36TD 46TD				C		W-2500	
22½							LVX		
24			PH95	802					
25	AP-25				25S 25SL				CWD-214
27		66TD							
28								W-2800	
30					30SL		LRSW		
34							LRVSW		
35					35T 35SL	B			CWD-321
36				803					
40	AP-40	10FFD							
48				802-B					
50		4LLD			50T				
64				803-B					





TRACTORS

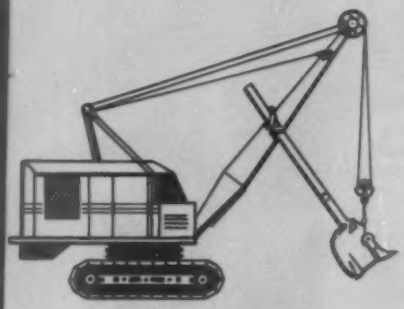
Size (M.P.)	Eimco	Le Tourneau Westinghouse	M-R-S	Wagner	Westfall
110				IND-6	
130				IND-9	100
160	105-T			IND-14	
175					175
210		C			
220			125	IND-18	Performer
262			150		Performer
300				IND-24	
310			190		
335			200		Performer
600			250		



TRACTOR SHOVELS

Size (yds.)	Clark	Eimco	Frank G. Hough (IH)	Mixermobile	Pettibone-Mulliken	Thew
1½		105 (Excavator)		LD5PD	125	
1¾						ML-153
1¾				LD7D		
2¼			HOD		175	
2½				LD7AD		
2¾	175A	105				
3½				LD8AD	250	
4	275A					
4¾				LD12AD		
6	375A			LD15AD LD12AD		

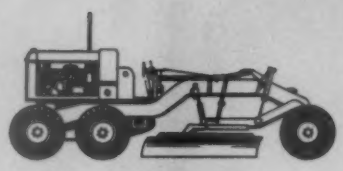
SHOVELS



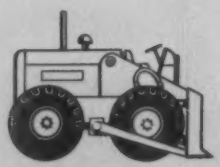
Size (yds.)	American Hoist	Baldwin Lima	Bay City	Bucyrus Erie	Dominion Engn. Wks.	Insley	Koehring	Link-Belt Speeder	Manitowoc	Marion Power	Orton	Thew
½											3E-CDT	
¾	300	34						LS-88		35-M	5E-CDT	
1	500	41	60			WB		LS-98	1600	43-M	8E-CDT	
1¼		81							2000		12E-CDT	Lorain 56
1½	700	604	72	38-B	480			K-300		362	16E-CDT	
1¾		703						K-300 K-370 K-375			22E-CDT	
2		802		51-B			805		3000		26E-CDT	
2½		803			550					93-M	32E-CDT 42E-CDT	
2¾				54-B					3500			
3				71-B			1205	K-608 K-608-L	3600	101-M		
3½		1201										
4		1601		88-B					4500	111-M		
5									4500			
5½									4500			

GRADERS

SIZE (M.P.)	ADAMS	GALION	HUBER-WARCO
80	330		
100		104	
115	440		
123	550		
130		T-500 118	6-D2
135	550-T		
160	660	T-600 160	7-D2
190	660-T	T-700	



TRACTOR-DOZERS



Weight (lbs.)	Clark	Eimco	Le Tourneau Westinghouse	Wagner	Westfall
16,500					100
20,100				IND-14	
22,500					175
27,600				IND-18	
33,380	180				
34,600			C		
37,000		105 105-T			
40,000					Performer
51,300	280				
74,150	380				
104,000	480				

SPECIALIZED CONSTRUCTION AND MINING EQUIPMENT MANUFACTURERS WITH CUMMINS (STANDARD OR OPTIONAL) POWERED MODELS

AIR COMPRESSORS
Chicago Pneumatic Tool Co.
Joy Manufacturing Company
Worthington Corporation

BATCH PLANTS
Barber-Greene Company
Hetherington and Berner Inc.
Iowa Manufacturing Co.

BUCKET LOADERS
Barber-Greene Company
Pettibone-New York Div.

COMPACTORS
Buffalo—Springfield Roller Company

CRANE CARRIERS
Baldwin-Lima-Hamilton
Crane Carrier Canada Ltd.
Crane Carrier Corporation
Hendrickson Manufacturing Company
KW-Dart Truck Company
Sicard, Inc.
The Maxi Corporation

CRUSHING PLANTS
Bros Inc.
Diamond Iron Works
Eagle Crusher Company
Iowa Manufacturing Company
Lima Austin-Western
Universal Engineering Company

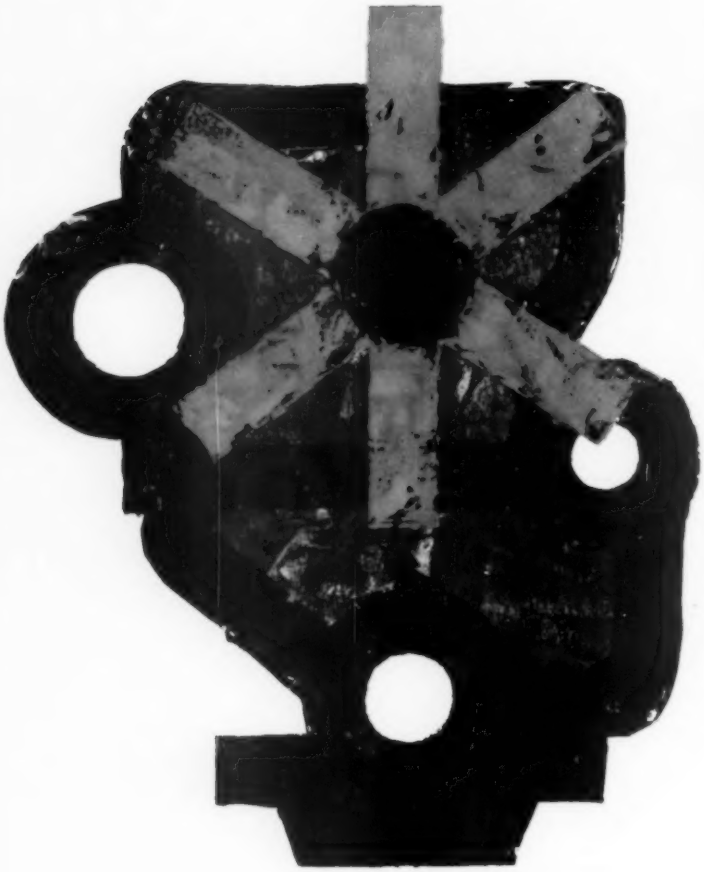
DITCHERS
Barber-Greene Company

DRILLS
Reich Brothers Manufacturing Co.

MIXERS
Barber-Greene Company
Bros Inc.
Iowa Manufacturing Co.
Pettibone-Wood Manufacturing Co.

PAVERS
Chain Belt Company (Rex)
Iowa Manufacturing Co.
Worthington Corporation

ON AND OFF-HIGHWAY DUMP TRUCKS IN 62 MODELS BY 18 MANUFACTURERS



REPOWER WITH CUMMINS

32 models for every application

HP	Model
100 h.p.	J-6
110 h.p.	JF-6
115 h.p.	HR-4
115 h.p.	HRC-4
130 h.p.	NHC-4
130 h.p.	JN-6
130 h.p.	NT-130
160 h.p.	JS-6
160 h.p.	H-6
165 h.p.	NT-4
175 h.p.	JNS-6
175 h.p.	HR-6
175 h.p.	JT-6
180 h.p.	NT-180
180 h.p.	NH-180
190 h.p.	HRF-6

HP	Model
195 h.p.	NH-195
200 h.p.	HS-6
200 h.p.	NT-200
220 h.p.	NH-220
240 h.p.	HRS-6
250 h.p.	NT-6
262 h.p.	NTO-6
265 h.p.	L-6
290 h.p.	NHS-6
300 h.p.	NRT-6
320 h.p.	NHRS-6
320 h.p.	LR-6
335 h.p.	NRTO-6
450 h.p.	NVH-12
450 h.p.	LRT-6
600 h.p.	VT-12

Only Cummins offers a diesel for every construction machine . . . with these features!

- **Cummins Engineered Repowering.** Job-site or shop conversions. Installations are made from factory approved repowering studies.
- **Cummins Long Engine Life.** Better heat dissipation afforded by 4-cycle design, coupled with Cummins sturdier construction of crankshaft and other components, means longer engine life for you.
- **Cummins Economy.** The highly efficient Cummins designed combustion chamber provides maximum fuel economy—saving as much as 50¢ per operating hour!
- **Cummins PT Fuel System.** With only 188 parts, as much as 275 fewer parts than competitive systems, you have simplicity and economy of maintenance.
- **Cummins Dirt-Proofing.** Air cleaners, caps, connections, oil system and all entrance points for destructive grit have been made dirt-proof by Cummins proven protective system.
- **Cummins Service.** Geared to your on-the-job service needs—just call your local Cummins Distributor and he'll be there—more than 300 service points throughout the U.S. and Canada.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

EXPORT — CUMMINS DIESEL EXPORT CORPORATION — COLUMBUS, INDIANA, U. S. A. — CABLE: CUMDIEX
OVERSEAS FACTORY — CUMMINS ENGINE COMPANY LIMITED — SHOTTS, LANARKSHIRE, SCOTLAND — CABLE: CUMSCOT SHOTTS TELEX

Litho in U.S.A.

PEOPLE IN THE NEWS

Heads Potash Co. of America

F. O. DAVIS, executive vice president and treasurer, has been elected president of the Potash Co. of America, Carlsbad, N.M., succeeding G. F. Coope, who has retired.

IMCC district sales manager

GERD W. KRAEMER has been appointed district sales manager of the phosphate chemical division of International Minerals & Chemical Corp., Chicago, Ill., with headquarters in Omaha, Neb.

Frank Renwick heads Chicago Gravel Co.

FRANK E. RENWICK, formerly vice president and treasurer, has been elected president of the Chicago Gravel Co., Chicago, Ill., succeeding George W. Renwick, who has retired but continues as a member of the board of directors. John M. Smyth, chief accountant, has been appointed to the position of treasurer.

Huron treasurer



JOHN B. FORD, III, has been elected treasurer of the Huron Portland Cement Co., Detroit, Mich., according to an announcement by Paul H. Townsend, president, who has been serving as treasurer since 1953. Mr. Ford joined Huron in 1953 and was named assistant treasurer in 1955.



Archibald



Woomer

SME honors go to Woomer and Archibald

THE SOCIETY OF MINING ENGINEERS, a constituent body of the American Institute of Mining, Metallurgical and Petroleum Engineers, has honored two of its members in recent announcements: Jerome W. Woomer has been elected president of the society for one year beginning February, 1959, and Ralph S. Archibald will be the recipient of the Daniel C. Jackling Award at the February meeting.

Mr. Woomer, a Pittsburgh consultant, succeeds Stanley D. Michaelson of Salt Lake City. Arthur B. Cummins, Manville, N.J., manager of the Central Chemical and Physical Research Department, Johns-Manville Research Center, is the new president-elect for 1960.

Donald W. Scott, Hibbing, Minn., will take office in 1959 as SME vice president for the central regional area. New members of the board of directors will be James C. Gray of Pittsburgh, John G. Broughton, New York; William B. Stephenson, Wynnewood, Pa.; Ewald Kipp, Salt Lake City; and Sherwin F. Kelly, Amawalk, N.Y.

Mr. Woomer heads J. W. Woomer & Associates. He has B. S. and E. M. degrees from Pennsylvania State University and engaged extensively in the coal industry before forming his own firm in 1940. His professional work has taken him to all parts of the world where mining is carried on in coal, lignite, clays, potash, copper, uranium, iron, oil, sands and oil shales.

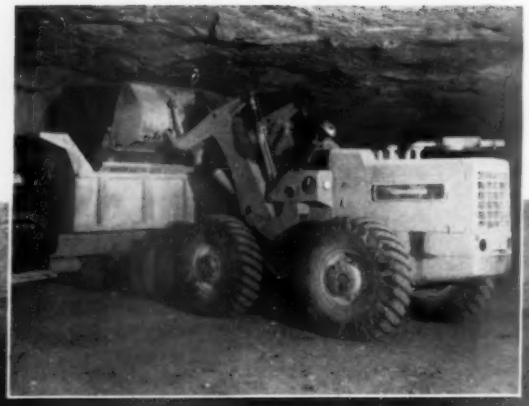
Mr. Archibald, as the Jackling award winner, will give the Jackling lecture at the annual meeting of AIME in San Francisco in February, 1959. The honor is for "significant contributions to technical progress in the fields of mining, geology and geophysics."

A distinguished mining man, Mr. Archibald is chairman and former president of North Range Mining Co., Negaunee, Mich. Since his graduation from Lehigh University in 1907 as a mining engineer, he has gained vast experience and reputation as geologist and consultant. Setting up his own practice in 1915 as consultant, he served Jones & Laughlin Steel Corp., Inland Steel Co., the C. K. Quinn interests, Palms Book Land Co. and other major organizations. He was consulting geologist for Inland Steel from 1930-1954, highly active in the examination of iron ore lands in Michigan, Minnesota and Wisconsin and in connection with the acquisition of Upper Michigan areas now the site of Inland Steel limestone quarries. As a consultant for Santa Fe Railroad, his work concerned uranium deposits activities in the Grants, N. Mex., region.

In 1933, Mr. Archibald and his associates organized the North Range Mining Co.

(Continued on page 40)

How **PAYLOADER**® opens the door . . .



. . . to REDUCED OPERATING COSTS

AT UNION QUARRIES, INC. near Kansas City, limestone is mined underground by the room method. About half of the daily output of 2200 tons of rock is loaded into trucks by a PAYLOADER with 9,000 lbs. carry capacity. The other half is handled by a special power shovel.

"We will replace the shovel one of these days."

"We have noticed," says Foreman Gene Totten, "how easily the PAYLOADER is able to outwork the shovel. It moves around for scattered rock, works faster and makes a clean, neat job. We'll replace the shovel one of these days and my choice is another Hough for the job."

Union Quarries has found good use for the operating efficiency of an identical PAYLOADER in their storage yard above ground for stockpiling crushed stone and loading trucks. With its carry capacity of 9,000 lbs., this 4-wheel drive unit has good balance and traction to keep yard production moving without pushing. Pry-out bucket action digs the packed materials faster and easier than any wheeled tractor-shovel of comparable size.

This unique roll-back bucket action of the PAYLOADER gets and keeps a full payload during delivery; its power-transfer differentials and heavy-duty axles assure adequate digging power and reliable traction in any ground condition, and the power shift transmission, power steering and 4-wheel power brake features guarantee operating ease, operator safety and unmatched work-ability for the PAYLOADER.

AT BUCHANAN STONE COMPANY an all-electric crushing and washing plant produces 7 types of stone from granite that is sold within a 30-mile radius of Greensboro, North Carolina. Annual production runs about 300,000 tons and 80% of this material is stockpiled and loaded out later by their two 9,000 pound carry capacity PAYLOADER tractor-shovels.

2 PAYLOADER units replaced old loader and three shovels

How Buchanan converted its stockpile-load out operation from a 4-machine into a 2-machine 100% PAYLOADER set-up is related by W. L. Buchanan, Vice-Pres. and Supt. "We purchased our first PAYLOADER in March, 1957," to replace an older (smaller) loader. The Company particularly liked the mobility of the PAYLOADER that enabled it to work from several stockpiles almost simultaneously.

"In December we bought the second PAYLOADER to replace three ¾ yd. shovels on stockpile load-out. Both machines have been steady producers with minimum time loss. Matched engine power with PAYLOADER pry-out digging action and full capacity roll-back bucket lets our operators load-out 15 ton loads in 2½ to 3 minutes. In addition, they do general plant clean-up and maintenance work."





80% of Buchanan's 300,000 ton annual production is stockpiled and loaded-out with 9,000-lb. carry-capacity PAYLOADER tractor-shovels.

THE LIMESTONE DAYTON COMPANY has produced limestone road base materials from its quarry and crusher in Dayton, Ohio, for about 5 years. Crushing capacity of the plant is 5,000 tons per 8 hours and one 9,000 lb. carry capacity PAYLOADER does all the truck loading for this 100% stockpile operation.

1 PAYLOADER replaced previous two machines

This producer experienced a substantial saving in operating costs because, "the PAYLOADER does all our loading and has practically replaced a previous 2-machine operation with very satisfactory results," says Plant Manager John W. Leet. "It takes care of 35 to 40 truck units, hauling from stockpile during an everyday operation." On several occasions it has handled up to 3500 tons in 6 hours and also does general stockpile maintenance.

Perhaps the extra maneuverability and work-ability of 4-wheel drive PAYLOADER tractor-shovels is the solution to your "sky-high" equipment upkeep and operating cost. There is a PAYLOADER size to fit your work and a Hough Distributor ready to demonstrate. Ask him about Hough Purchase and Lease Plans too. The Frank G. Hough Co., 705 Sunnyside Ave., Libertyville, Ill. 10-B-1

PAYLOADER, PAYMOVER, PAYLOGGER and HOUGH are Registered Trademarks of The Frank G. Hough Co.

Modern Materials Handling Equipment
THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

A 70-acre tract is the site of Limestone Dayton's 100% stockpile operation. One PAYLOADER loads-out the road stabilizing materials.





Enter 1457 on Reader Card

PEOPLE IN THE NEWS

(Continued from page 37)



Ohio Lime names engineer

EDWARD L. MAUNTLER has joined the engineering department of the Ohio Lime Co., Woodville, Ohio. His father, M. F. Mauntler, is purchasing agent of the company and his grandfather, Edward H. Mauntler, now retired, served as treasurer and secretary for many years.

J. R. Simplot appointments

PHILIP T. PETERSON has been appointed manager of the new Boville, Idaho, clay mine operations of J. R. Simplot Co., Boise, Idaho. He was formerly manager of the Gay phosphate mine at Fort Hall, Idaho. John Clouser, who has been serving as superintendent of the Gay mine, has been promoted to general superintendent of the mine. Dave Aro has been named superintendent of the Centennial phosphate mine near Monida, Mont. He was formerly resident engineer at the Gay mine and will be succeeded by Robert Hill, formerly associated with Anaconda Mining Co. Norman Lehman, a graduate of Stanford University, has been appointed geologist for the Gay phosphate mine.

Witt elected to AICE

DR. J. C. WITT, cement consultant, has been elected to membership in the American Institute of Consulting Engineers. A mechanical engineering graduate of Armour (now Illinois) Institute of Technology, Chicago, Ill., Dr. Witt is also a fellow of the American Society of Mechanical Engineers. After many years of experience in various phases of cement manufacture, Dr. Witt became a consulting engineer some 10 years ago, specializing in cement and concrete, including the development of plant equipment and processes. His consultation work has carried him to many sections of the United States.

Dr. Witt has also been selected to prepare a chapter on portland cement for a new publication of the American Institute of Chemical Engineers. This book, which includes several chapters discussing each of the chemical industries, has been published by AICE in commemoration of its 75th anniversary. In his chapter, Dr. Witt will discuss all phases of cement manufacture and processing.

Assistant manager

RALPH E. RITCHIE has been promoted to assistant manager of the Arkansas sales branch of the Fischer Lime & Cement Co., Memphis, Tenn. A graduate of the University of Arkansas, Fayetteville, Ark., Mr. Ritchie joined the company in 1952, and one year later became sales representative for southern Arkansas, where he will be succeeded by William R. Pedigo.

Ruberoid promotions

W. G. NEEL has been named manager of the asbestos fiber division of The Ruberoid Co., New York, N.Y. He was formerly sales manager of the Denver district. Mr. Neel joined the company in 1954 as special assistant to the vice president in charge of sales, was made Salt Lake City district sales manager the same year, and was placed in charge of the Denver-Salt Lake City district in 1957.

James C. Murphy, assistant sales manager of the Dallas, Texas, district, since 1955, succeeds Mr. Neel as sales manager at Denver, and Frank J. Schmitt, Jr., sales representative at Oklahoma City, replaces Mr. Murphy as assistant sales manager at Dallas.

On Alpha board of directors

J. S. BAKER, JR., a vice president of The Chase Manhattan Bank, New York, N.Y., has been elected a director of the Alpha Portland Cement Co., Easton, Pa.

END

OBITUARIES

George H. Cook, general superintendent of the Stewart Sand & Material Co., Kansas City, Mo., died July 21. Born in Columbus, Ind., Mr. Cook had lived in Kansas City for 53 years, 38 of which he served with the Stewart Sand & Material Co. A civil engineering graduate of Purdue University, Lafayette, Ind., Mr. Cook was a life member and past president of the Kansas City Engineers Club.

Osborn Biglow Gilson, former general sales manager of Ideal Cement Co. at Ogden, Utah, passed away July 7. He was 97 years of age. Born in St. Louis, Mo., Mr. Gilson moved to Ogden in 1906, serving for a time with the Denver & Rio Grande Western R. R. Co. He later became associated with Ideal Cement Co. as general sales manager, retiring in 1945. He also had been a director of the Utah Southern Oil Co.

Leo T. Waller, co-owner of the Waller Bros. Stone Co., Portsmouth, Ohio, died suddenly on August 9. He was 54 years of age.

Clarence A. Sanborn, president and general manager of the Casey Stone Co., Casey, Ill., passed away May 26. He was also vice president and director of Lehigh Stone Co., Kankakee, Ill. Mr. Sanborn is the son of W. R. Sanborn, president of the Lehigh Stone Co. and a member of the board of directors of the National Crushed Stone Association.

George Dunton Youngclaus, well known in engineering and construction circles in Southern California, died in Whittier, Calif., July 25 at the age of 37. At the time of his death, Mr. Youngclaus was vice president of Western Concrete Structures Co., Inc., Los Angeles, specializing in prestressed lift-slab construction.

For seven years prior to his affiliation with Western Concrete Structures in 1956, Mr. Youngclaus was a structural engineer with the Los Angeles district office of Portland Cement Association. He also worked for a Denver architectural firm for two years, following his graduation in 1947 from the University of Colorado with a degree in architectural engineering.

Joseph A. Torer, traffic manager of Medusa Portland Cement Co., Cleveland, Ohio, died July 21 at the age of 52. He had been associated with Medusa for 33 years, and for many years was active in the Traffic Club of Cleveland.

Edward J. Kaufman, vice president of Marble Cliff Quarries Co., Columbus, Ohio, died July 24. He was 76 years of age and had been with the company since 1913.

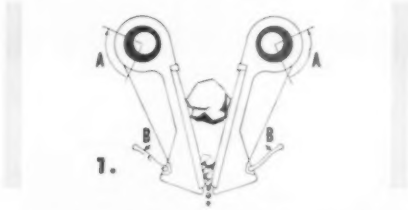
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BIG PRIMARY CAPACITY

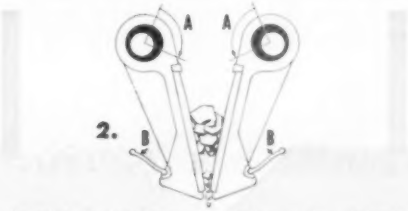


TWO MOVABLE JAWS GIVE YOU 40% TO 100% HIGHER PRIMARY CAPACITY THAN SINGLE-JAW CRUSHERS OF THE SAME SIZE

CEDARAPIDS TWIN JAW CRUSHERS



Drawings illustrate maximum throw of the two counter-rotating eccentrics, A. Since *both* jaws move, maximum opening at top of crushing chamber is larger. Coupled with higher RPM, this permits faster feeding. Drawing 1 also shows bottoms of jaws, controlled by steep-angled toggles, B, beginning to close for the secondary crushing action.



Drawing 2 shows top of chamber at its minimum opening as the two synchronized eccentrics swing inward and downward, forcing material deep into the chamber. Simultaneously, the discharge opening is widening for quick discharge of crushed material.

Think what it would mean in terms of overall plant production—and profit—to get 40% to 100% greater primary capacity than you're getting now with a single-jaw primary!

The exclusive Cedarapids Twin Jaw Crusher combines overhead eccentric design with *two* movable, synchronized jaws *operating at high speed* to provide the high velocity jaw action that crushes tremendous hourly tonnages of even the hardest material. Its fast feeding features, its force-feed design that permits crushing without abrasive rubbing, and its rapid discharge all help maintain the Twin Jaw's steady, high-volume production pace. With rubbing under pressure practically eliminated, owners report from five to eight times the jaw life they get from single-jaw crushers, and with much lower maintenance!

There are dozens of other Twin Jaw features you'll want to investigate. Bulletin TJ-1 contains every detail—send for it today, or see your Cedarapids Dealer.

Cedarapids

Built by IOWA

IOWA MANUFACTURING COMPANY

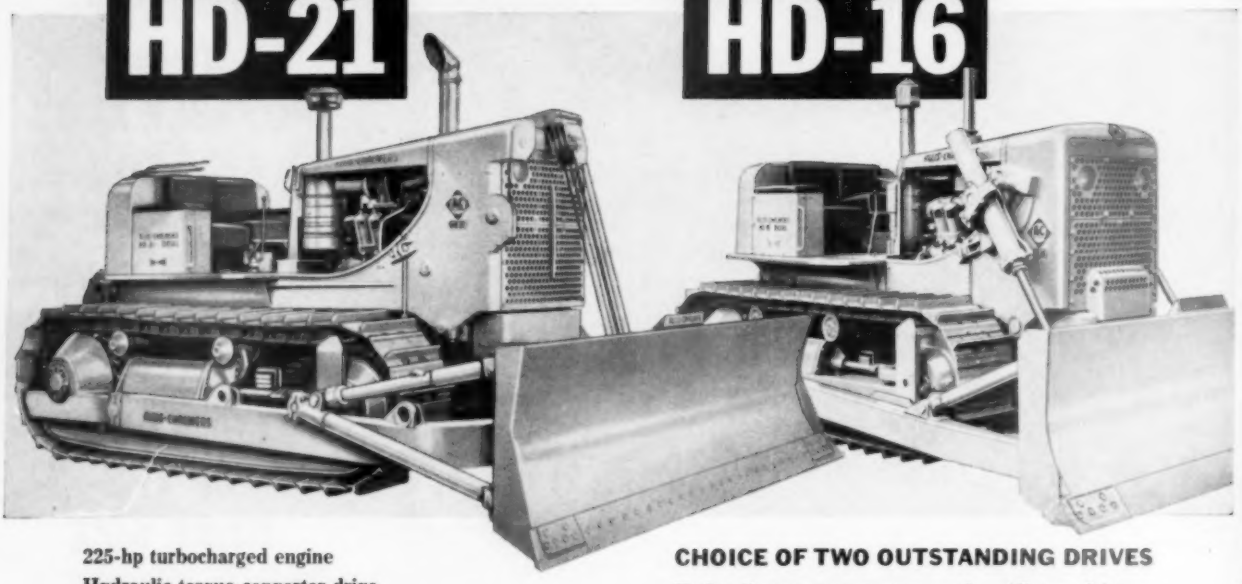
Cedar Rapids, Iowa, U. S. A.

ALLIS-CHALMERS CRAWLER TRACTORS . . .

first choice on more and

ALLIS-CHALMERS **HD-21**

ALLIS-CHALMERS **HD-16**



225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.
HD-21A illustrated—Two other models available

CHOICE OF TWO OUTSTANDING DRIVES

Hydraulic torque converter	All-gear drive
150 net engine hp	141 belt hp
39,090 lb (approx. as shown)	125 drawbar hp

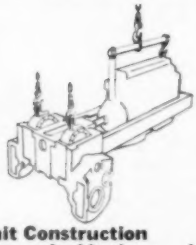
Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.
HD-16DC illustrated—Five other models available

THE ONLY COMPLETE LINE OF CRAWLER TRACTORS

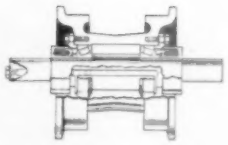
Pioneered and proved by Allis-Chalmers Engineering in Action



Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. *(Available in HD-21 and HD-16 only.)*



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



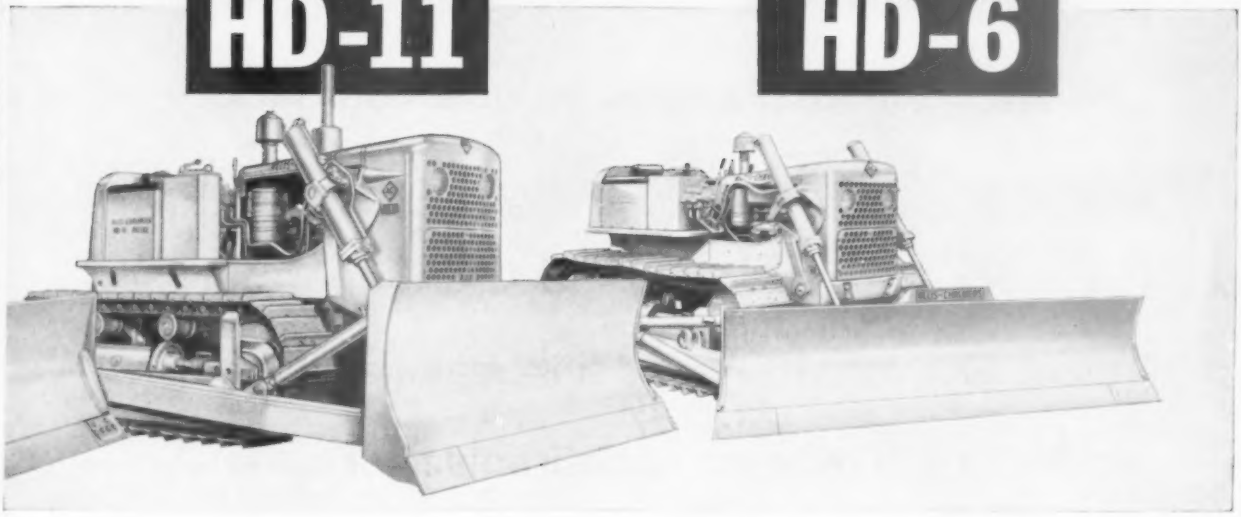
1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

Look ahead...*move ahead*...and stay ahead

more tough jobs

ALLIS-CHALMERS HD-11

ALLIS-CHALMERS HD-6



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range . . . offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated—Two other models available

63 belt hp

16,470 lb (approx. as shown)

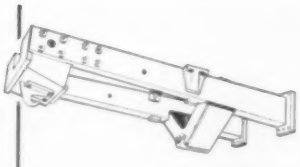
Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

HD-6E illustrated—Three other models available

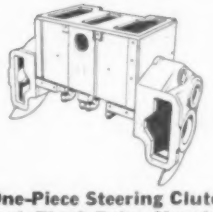
THAT GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE



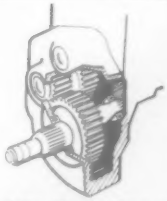
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.



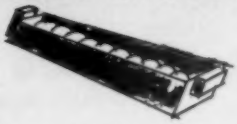
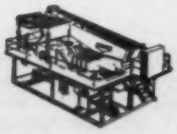
Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

with ALLIS-CHALMERS

Enter 1551 on Reader Card

The Eagle Heavy Media Separation Plant offers many features which make it ideal for aggregate producers with separation problems not solved by usual methods. Features include: Four factory pre-assembled units that go together like building blocks; 

Famous O.C.C. Separatory Vessel recovers 100% of sink material,  separates and removes undesirable float material; The Eagle Screw  Densifier recovers heavy media used for separation so it can be used again; Above Ground  Heavy Media Spillage Sump eliminates need for underground concrete pit...makes moving easier. Plus other features that make Eagle the most efficient Heavy Media Separation  Plant today!

Write SINCE 1872 EIW EAGLE IRON WORKS for details!

137 Holcomb Ave., Des Moines, Iowa

Enter 1403 on Reader Card

INDUSTRY NEWS

New gypsum plant OK'd by U. S. Gypsum

UNITED STATES GYPSUM CO., Chicago, Ill., authorized construction in August of a new gypsum products plant at Sperry, Iowa. The fourth USG plant in the Midwest, the Sperry operation, near Burlington, will serve eastern Iowa, northern Missouri, Illinois, Wisconsin and Minnesota. According to C. H. Shaver, chairman of the board, the plant will produce enough gypsum products to finish the walls and ceilings of more than 40,000 houses annually.

The company's action has been interpreted as reflecting an upturn in the building industry. At the same time, USG directors voted an extra dividend of 35 cents a share on its common stock, bringing 1958 declarations to $1.85 per share to that date, comparing with $1.70 in 1957.

Second fluxstone layer discovered at Marblehead

CHEMSTONE CORP., Cleveland, Ohio, has discovered a 50-ft. layer of fluxstone at its Marblehead quarry which can extend the life of the quarry several hundred years. There was a 10-year supply left in the present fluxstone quarrying operation; this is underlain with a 12-ft. layer of commercial grade limestone, just above the new fluxstone layer.

Benjamin Capretta, plant manager, said that successful development of the new quarrying operation will mean facilities will have to be expanded. A new crushing plant, more dock space and loading equipment will be needed.



Ada plant to have 5½-mile conveyor system

IDEAL CEMENT CO., Denver, Colo., awarded to Link-Belt Co. a contract for a 5½-mile-long conveying system as part of the $22-million expansion program at its Ada plant. This is said to be the longest permanent cross-country transport belt conveying system ever constructed.

The 36-in. wide conveyor will transport crushed limestone and shale at the rate of 1,000 tons per hour from Ideal's Lawrence, Okla., quarry to the Ada plant. Construction of the all-weather conveyor is scheduled for completion early next year.

The entire system comprises seven conveyors arranged consecutively to provide continuous flow of material. The length of the longest individual conveyor will be 11,920 ft. This conveyor will require a single belt more than 4½ miles long.

Prestressed lightweight concrete channels will support the conveyor and provide a continuous all-weather cover. Conveyor drives and terminal machinery will be supported on steel structures and corrugated aluminum guards will provide protection from winds.

Flintkote acquires container company

THE FLINTKOTE CO., East Rutherford, N.J., is acquiring Hankins Container Co., Cleveland, Ohio, through an exchange of stock. The merger agreement, subject to approval of stockholders of both companies, was announced jointly by I. J. Harvey, Jr., Flintkote chairman of the board, and W. L. Davis, president of Hankins Container.

International concern to develop African bauxite

FIVE COMPANIES, including Olin Mathieson Chemical Corp., New York, N.Y., have formed an international concern to mine and develop African bauxite deposits. The new company is called FRIA pour la Production de l'Alumine, and percentages of ownership are: Olin Mathieson, 53½; Pechiney & Co. and Ugine & Co., both French, 26½ together; Aluminum Industrie Aktiengesellschaft, Zurich, 10 and British Aluminium Co. Ltd., 10.

Olin officials have said the venture, in French West Africa, will cost an estimated $135 million, with Olin Mathieson putting up $21 million of that amount. The four foreign companies will raise a total of $39 million, and the rest will come from institutions and other lenders. Negotiations are being conducted between Olin and the International Cooperation Administration for a U. S. government guarantee covering Olin's equity contribution to the project and the funds borrowed from institutional investors in the United States.

(Continued on page 46)

Plan cement plant to serve Odessa-Midland area

WESTERN CEMENT CORP., a firm organized by a group of Texas businessmen in the construction industry, announced plans to build an $8.5-million cement plant on U. S. Highway 80, 12 miles west of Odessa. According to Everett Knott of Dallas, president, construction will be handled by Turnbull, Inc., of Dallas, Cleveland, and Washington, D.C. The plant will have an annual capacity of 1,400,000 bbl.

Besides Mr. Knott, directors of the corporation include F. M. Reeves of Pecos and Odessa; J. W. Bateson, Dallas; L. A. Purtell, Lubbock; Sam B. Hicks, Shreveport, La.; Roger Peabody, Dallas; Cameron McElroy, Jr., Marshall; Wendell A. Falscraf, Cleveland. Tom Sealy, Midland, is general counsel.

The Odessa-Midland area had been under study for three years, according to Mr. Knott. The new plant will enable the company to serve the rapidly growing Permian Basin area, including eastern New Mexico, Lubbock, Amarillo and the surrounding territory.

INDUSTRY NEWS

(Continued from preceding page)

Arkansas cement plant is nearing completion

ARKANSAS CEMENT CORP., Little Rock, Ark., reported that construction of its new plant near Foreman, Ark., was 85-percent complete in August. The stone receiving hopper and stockpile conveyor were put in operation, and all major equipment was installed. Work remaining consists of piping, electrical and auxiliary items. The 22-mile natural gas pipeline to serve the plant was laid and undergoing testing.

Some stockpiling of raw materials also had begun. Initial capacity of the plant will be 1,400,000 bbl. of cement annually, marketed under the trade name Foreman Cement.

Corson reports to stockholders

G. & W. H. CORSON, INC., Plymouth Meeting, Pa., reported net sales for the six months ended June 30, 1958, amounting to $3,703,917 compared with $3,996,385 in the like period of 1957. Net earnings for the first six months of 1958 were $238,843, equal to 51 cents per share. This compared with net earnings for the first six months of 1957 of $375,291, equal to 81 cents per share adjusted to reflect the number of shares of stock now outstanding.

Philip L. Corson, chairman, and Bolton L. Corson, president, told stockholders that the decrease in earnings was due to the general business decline and bad weather conditions during the first quarter. "While our operations have been affected by the recession, the diversified fields in which we operate have cushioned the effect. We are gratified with the progress we are making with our new products," the Corson officials stated.

In May, 1957, the Corson company announced the development of a new type of battery, known as the ammonia vapor activated battery. At the same time the company licensed Eastman Kodak Co. to manufacture the product under Corson patents. The officials reported that the Corson company has recently received trial orders for several types of these batteries from the U. S. Government. The Eastman Co. is also working on this development.

The officials stated that Corson's road material Poz-O-Pac has made progress and that three new central-mix plants are going into operation. Development work continues on a number of other projects.

New Bestwall plant is under construction

BESTWALL GYPSUM CO., Ardmore, Pa., began construction during June of a multi-million dollar gypsum board, lath and plaster plant at Brunswick, Ga. It is anticipated that the plant will employ approximately 250 production workers and have a capacity of 300 million sq. ft. of gypsum board and lath products a year. The plant will use up to 300,000 tons of gypsum rock annually.

The plant should go into operation late in 1959. Harold Zelms, presently plant manager of Bestwall's Acme, Texas, plant, will administer the construction program at Brunswick, and will manage the completed plant.



Historical marker

HURON PORTLAND CEMENT CO., Detroit, Michigan, cooperating with the Michigan Historical Commission, dedicated this historical marker at the site of its Alpena, Mich., plant. The purpose of the marker, according to George S. May, historic site specialist of the Michigan Historical Commission, "is to recognize the existence of the world's largest cement plant and the contributions of the company to the growth and progress of Michigan during the past 50 years."

Bill strengthens ICC authority

THE TRANSPORTATION ACT OF 1958 strengthens the authority of the Interstate Commerce Commission to deal with intrastate railroad rates. High points of the legislation were condensed for members of National Crushed Stone Association by NCSA's counsel, the firm of Gall, Lane and Howe, as follows:

The new act would authorize the commission to adjust an intrastate rate where it finds, after a full hearing, that the rate involved causes an "undue burden" on interstate commerce. Heretofore the commission had authority to remove "discriminations" against interstate commerce by making adjustments in intrastate rates and this authority, according to the Conference Committee Report on the new act, "has been exercised by the commission for many years under existing law."

However, the report states that the additional language authorizing adjustments in intrastate rates which cause an "undue burden" on interstate commerce "would serve to remove any doubt as to the commission's power in instances where, upon appropriate records, it finds, as it has done in some section 13 proceedings, that the burden cast upon interstate commerce by intrastate rates or charges is undue and therefore unjustly discriminatory. Such findings have been questioned in the courts."

The act also includes provisions which may be generally described to:

1. Avoid delays in intrastate rate proceedings by requiring ICC to proceed promptly in such cases despite pendency of proceedings on the same issue before a state commission.

2. To make it clear that in deciding whether to make an intrastate rate adjustment ICC need not consider "the overall statewide totality of a carrier's operating results."

3. Eliminate so-called "pseudo-private" transportation of property by trucks. Thus, private carriers must be in fact private carriers, and not indulge in common carriage under the facade of being a private carrier.

Department of Commerce lists cement imports

IMPORTS OF PORTLAND CEMENT and cement clinker for the years 1955, 1956 and the first six months of 1957 have been published by the Department of Commerce. Statistics from the Customs Districts have provided the following totals:

Approximate quantity (bbl.) of portland cement and clinker imported

			Jan.-June
Portland cement,	1955	1956	1957
except white nonstaining	4,560,700	3,601,200	968,100
White nonstaining portland cement	192,800	300,300	169,800
Cement clinker	467,000	483,500	119,700

4. To provide: "a method and procedures to make it possible for carriers by railroad subject to the Interstate Commerce Act to discontinue or change, in whole or in part, the operation or service of trains or ferries operated by such carriers, notwithstanding otherwise applicable state laws. At present the Interstate Commerce Commission has no jurisdiction over discontinuance of service unless a whole 'line of railroad' is involved."

More plaster production planned by Fibreboard

FIBREBOARD PAPER PRODUCTS CORP., San Francisco, Calif., announced expansion of primary production capacity at its Florence, Colo., gypsum products plant. Construction of a new plaster mill of 45,000-ton annual capacity has begun. Completion is scheduled for mid-1959.

The new mill, located adjacent to the gypsum wallboard and lath manufacturing plant, will be a facility of Fibreboard's Fabco Building Materials Division. It will produce plaster for distribution throughout the Rocky Mountain area, and is another step in the company's long-range expansion and diversification plan, according to R. R. Galloway, vice president and general manager of the Building Materials Division.

Studies tell how to interpret work injuries

WORK INJURY CASE STUDIES, dealing with 100 specific instances, have been interpreted by American Standards Association to show companies how to record and compile accident statistics. Each case was interpreted by an ASA committee to give a ruling on reportability under American Standard Z16.1-1954, Method of Recording and Measuring Work Injuries. The booklet of case studies is available at 75 cents per copy from American Standards Association PR11, 70 E. 45th St., New York 17, N.Y.

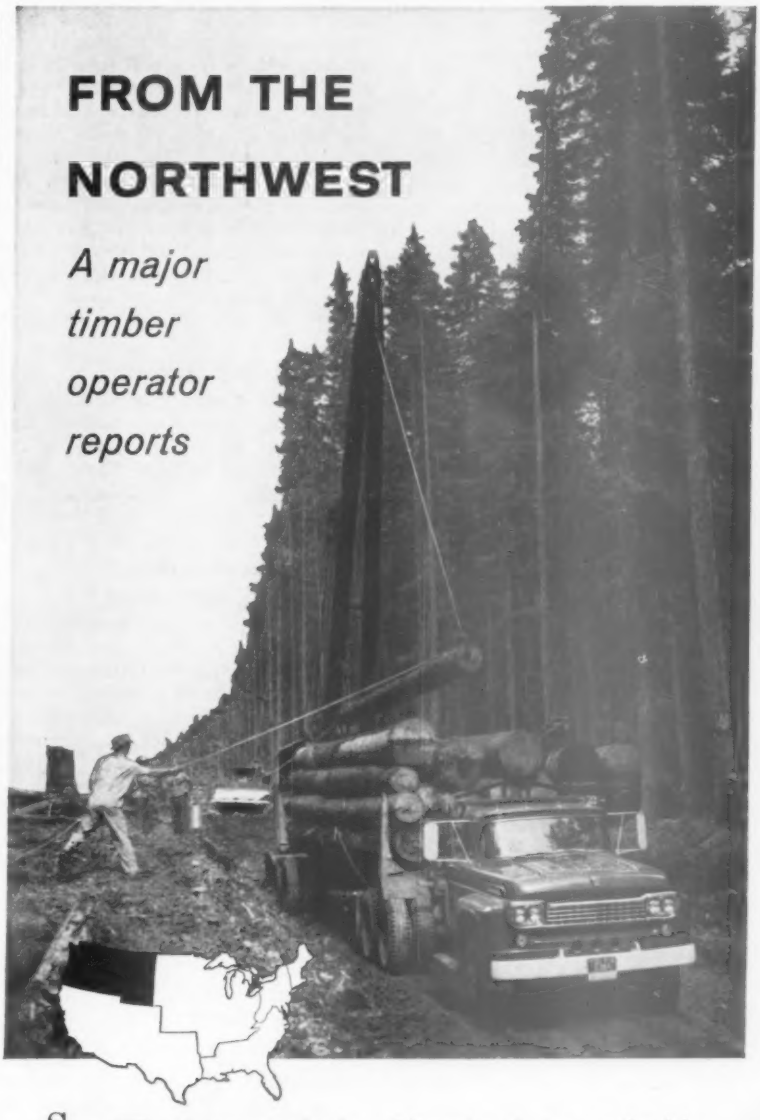
Gravel company has open house

LAKESIDE GRAVEL CO., Bellevue, Wash., invited area contractors to an open house to show Telsmith equipment installed at the newly reconstructed Issaquah plant. Featured were a 5 x 12, three-deck vibrating screen and two sand classifiers: a 20 x 15-ft. single screw and a 30 x 25-ft. double screw. Also pointed out to the visitors was the new Telsmith 10 x 28 ft. dewatering and classifying tank.

(Continued on following page)

FROM THE NORTHWEST

A major timber operator reports



Steve Wilson's company hauls logs from mountainous Oregon timber stands—over crude roads with grades up to 18%.

Mr. Wilson has 43 Ford trucks and tractors that haul nearly 300,000 board feet of logs and rough lumber a day.

"I can't think of a tougher job for a truck than my operation," says Steve Wilson. "I need trucks that can take punishment and *stay* on the job. If a load of logs isn't delivered on schedule, I can lose plenty."

The tractor in the picture is a 1958 Ford T-850.

It is powered by a 534-cubic inch V-8 engine. Rear axle ratio is 6.69 to 1, wheelbase is 192 inches. It is equipped with a 5-speed main transmission and a 4-speed auxiliary, and grosses 72-76,000 pounds.

"Diesels used to walk right around us, but today it's just the opposite. This big Ford climbs a 10% grade loaded at 11 miles an hour, compared to 6 mph for our previous truck."

S. O. Wilson

President
Steve Wilson Company

Enter 1407 on Reader Card

INDUSTRY NEWS

(Continued from preceding page)

Silica discovery

DORRIS EZELL, Murray, Ky., has discovered a high-purity silica deposit in Calloway County, along Blood River, and has formed a company to process the material. Preliminary studies indicate the deposit contains several million tons. In pit form, the silica is loose and can be recovered easily.

Award contract for loading dock

ST. LAWRENCE CEMENT CO., Clarkson, Ontario, has awarded a contract to Dravo of Canada Ltd., Toronto, for construction of a 480 ft. long loading dock at Ogden Point, Ontario. Located a quarter-mile from shore, the dock will feature steel sheet cellular pile construction. Included in the contract are a quarry stone causeway and a 700 ft. long trestle to carry a belt conveying system.

Locating the dock 1,300 ft. from shore in water 32 ft. deep eliminates the necessity for dredging a harbor to accommodate the draft of lake freighters. The dock will be used for loading limestone on ships bound from Ogden Point, near Colborne, to the Clarkson plant. Officials of St. Lawrence Cement Co. intend to start shipping early next summer.

A 40-ft. diam. cell to support loading equipment and four 35-ft. diam. cells will make up the face of the dock. The causeway, 30 ft. wide at the top and 600 ft. long, and four 25-ft. diam. cells will support the conveyor trestle. Each cell will rest on rock and will extend about 15 ft. above water level. They will be filled with quarry stone and capped with concrete. A structural steel walkway will connect the five dock cells. Dravo has awarded a sub-contract to Trent Valley Sand and Stone Ltd., Brighton, Ontario, to build the causeway.

Arundel Corp. moves

ARUNDEL CORP., Baltimore, Md., announces a change of address. Its main office was moved from Pier 2 Pratt St. to 501 St. Paul Place, Baltimore 2, Md.

Oklahoma area rich in gypsum, says report

A MINERAL REPORT compiled by Dr. William E. Ham and Neville M. Curtis, Jr., for the Oklahoma Geological Survey and published by the University of Oklahoma asserts that a 59-square mile area in Custer County, Okla., contains one of the major gypsum deposits in the United States.

Workable gypsum averages 36.17 ft. thick over an area of 24 sq. mi. In the Cloud Chief formation, the gypsum has a maximum thickness of 92 ft. Open pit mining methods can be used for working the gypsum, reported the geologists.

Two new kilns ordered for Riverside plant

RIVERSIDE CEMENT CO., Riverside, Calif., Division of American Cement Corp., awarded a contract to Allis-Chalmers Manufacturing Co. for two new rotary kilns to be installed at the company's Oro Grande plant near Victorville, Calif. Cost of the new equipment is estimated at $3.6 million.

The kilns, 310 ft. long, will have an annual rated capacity of 1,200,000 bbl. of clinker each. Included in the contract order were component pieces of equipment consisting of two-stage flash preheaters which will reduce gas temperatures entering dust collection equipment to 850 deg. F. This low temperature will facilitate dust collection in new electrostatic dust precipitators. "These new units will have a guaranteed percentage efficiency of 99.96, with expected efficiency even higher," said John M. Kinard, president of Riverside Cement Co.

In addition, Fuller horizontal grate coolers will be installed to reduce product temperature to approximately 100 deg. F. above surrounding air temperature.

A long range program calls for an ultimate of five new units. The first two will bring the Oro Grande plant into balance, so that future kilns will require additional grinding capacity. The first unit is scheduled for operation by April 1, 1959, with the second for June 1, 1959.

Five old kilns are being dismantled to provide space for future additional grinding facilities. When the second new kiln goes into operation the plant capacity will be boosted by about 20 percent, to more than 6 million bbl.

Solite plant construction to start this month

SOUTHERN LIGHTWEIGHT AGGREGATE CORP., Richmond, Va., announced that construction would start October 1 on a plant for manufacture of Solite lightweight aggregate at Russell, Fla. The company purchased 250 acres and optioned an additional 2,500 acres at Russell, near Jacksonville.

According to A. F. Old, vice-president, production may get under way by next March. Operating under the name of the Florida Solite Corp., the company will mine clay on the acquired properties and process it in rotary kilns at a temperature of 2,300 deg. F.

Springfield is Dayton's first customer for lime

DAYTON, OHIO'S lime reclamation plant (ROCK PRODUCTS, August, 1957, p. 61), which has been operating since last November, got its first order for lime when Springfield, Ohio's, city commission needed lime to test equipment at its new water treatment plant. About 285 tons were purchased at $10.50 per ton.

The Dayton plant reclaims lime added to the city water for softening purposes, and extracts the water's natural lime content. It has been producing 50 tons a day, although 150 tons are possible. It hasn't run at capacity because there wasn't the demand, said City Water Director William T. Eiffert.

Alpha ships first carload from new Lime Kiln plant

ALPHA PORTLAND CEMENT CO., Easton, Pa., has shipped the first carload of cement from its new Lime Kiln, Md., plant—400 bbl. were delivered to M. J. Grove Lime Co., Frederick, Md., ready mix firm. The new facility, which will make all standard types of cement and mortar, is intended to serve the growing construction needs in the Baltimore, Washington and surrounding areas.

Gets fluorspar contract

BURRO CHIEF MINES, INC., Deming, N.M., will be reactivated following the awarding of a 15-month government contract to Deming mining engineer Hugh E. McCray. Mr. McCray said he will erect a 150 to 200-ton, sink-float concentrating plant. Half of the required tonnage of 60-percent fluorspar will come from the Deming area.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for July and the first seven months of 1958 have been classified by the Portland Cement Association as follows:

	Sq. yd. awarded during	
	July	1st. 7 mos.
Roads	7,475,326	38,260,665
Streets and alleys	3,736,629	18,624,961
Airports	6,630,528	16,173,336
Totals	17,842,483	73,058,962

Cement company is reorganizing

TEXAS PORTLAND CEMENT CO., Orange, Texas, has received approval of the U. S. District Court at Tyler, Texas, of a voluntary petition for corporate reorganization, filed under the Bankruptcy Act. Chilton O'Brien and Martin Davis have been appointed trustees to take title and control of the company's property, records and assets; continue operation of the business, opening new books, notifying creditors, investigating conditions; and finally, to prepare and file a reorganization plan. The court's action stayed proceedings and steps by creditors to collect their debts until further orders.

The trustees have terminated the employment of Kent B. Diehl, president, in the interest of economy. No other management personnel changes were made. Texas Portland's plant is in full operation and cement is being produced, sold and delivered.

In a later hearing, held August 26, the court granted petitions of Trustees O'Brien and Davis to: 1. Issue $150,000 in additional certificates of indebtedness to be done if and when they deem necessary. 2. Pledge and assign accounts receivable in order to obtain more operating capital more quickly. 3. Assume contracts with utilities firms. 4. Move the general offices for accounting and administration to Beaumont.

NLA establishes fellowship on lime in clay mineralogy

NATIONAL LIME ASSOCIATION, spurred by the growing use of lime in road base construction, has established a three-year research fellowship on lime in clay mineralogy at the University of Illinois. The fellowship involves a fundamental study of the reaction of hydrated lime with selected pure clays and clay-type soils. The key objective is to determine the mechanism behind lime's altering of soil properties. It is felt that this will lead to the development of a quick, simple test to determine lime's effectiveness with various soils. Another goal is the classification of soils according to their potential reaction with lime.

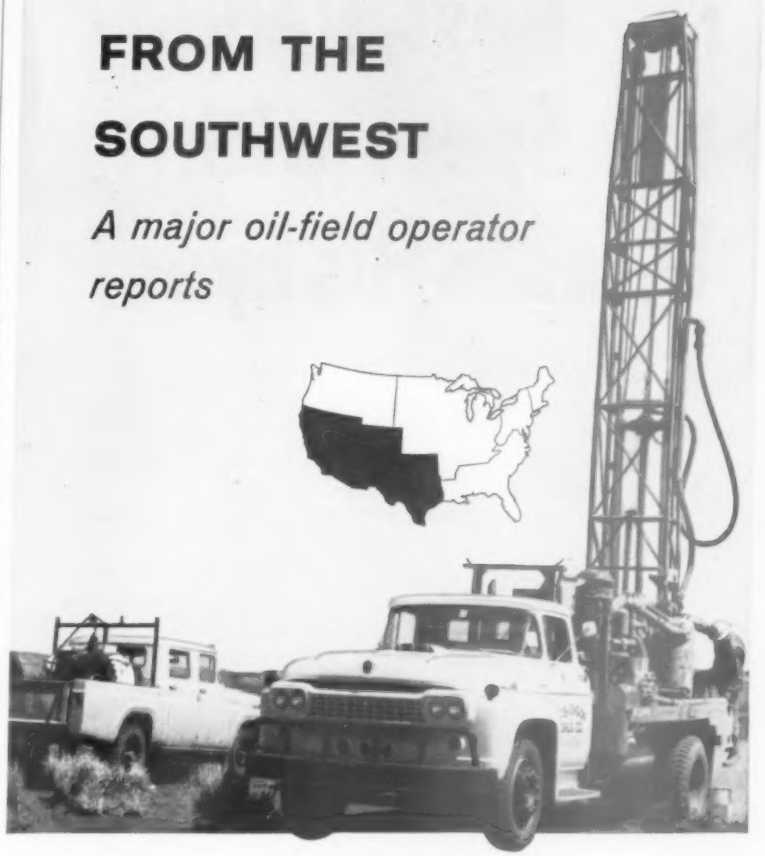
Work began in September, 1958, under the direction of Dr. Ralph E. Grim, professor, Department of Geology. Professor Grim is an authority on clay mineralogy; he has done extensive research and consulting work on clay products, drilling muds, kaolin and related fields.

James L. Eades, research soils engineer on leave from the Virginia Department of Highways, was the fellowship recipient.

(Continued on page 51)

FROM THE SOUTHWEST

A major oil-field operator reports



This '58 Ford F-850 runs all day . . . but hardly moves at all.

It belongs to the Stevenson Drilling Company of Houston, Texas. The truck goes only a few miles a day but its V-8 engine runs all day long—powering (transmission PTO) a drill that's searching for oil. The combination air-water drill makes 100-ft. deep "shot holes." The oil company geophysicists detonate dynamite in these holes for seismograph recordings that reveal the location of new oil deposits.

"We are really impressed with the way these new Ford Super Duty V-8's are engineered," says W. M. Stevenson. "We normally drill on propane, through a truck's carburetor throat, but the fuel costs of our Super Duty V-8 turned out to be so reasonable that we didn't need to switch."

The Super Duty V-8 power plant in the Stevenson Company's F-850 displaces 401 cubic inches. It has a 5-speed transmission and a two-speed rear axle ratio of 6.50/8.87 to 1. Wheelbase is 175 inches, gross weight 23,000 lb.

"We have used Fords since 1946. We like the availability of Ford replacement parts, their low cost and the excellent Ford service. I plan on buying Ford trucks 100% in the future."

W. M. Stevenson

President
Stevenson Drilling Company

Enter 1411 on Reader Card

"My Boss Read the Specs with Tears in His Eyes"



He looked like he'd lost his best friend — money.

"Goodbye contract," he said quietly. "We just can't hope to meet these government specifications for aggregate."

"Yeah, it's pretty hopeless with our set-up. Of course, if we had a hydraulic classifier — " (I was kidding.)

"You're out of your mind. Around here water costs more than sand."

"Well how about an air separator, like Sturtevant makes?" I shot back. "Pete's brother runs a pit at Rapid City and says they clean sand without water. By de-dusting it."

He was skeptical. "Aren't Sturtevants for cement?"

I nodded. "They are, but you see quite a few in aggregates, too, nowadays. Might be worth a try."

The Boss smiled for the first time that morning. "What the heck are you waiting for? Get 'em on the phone and let's see what they can do."

So we got the contract, thanks to the 12 ft. Sturtevant we now use for de-dusting and pre-classification. It's a beaut. Gives good service outdoors the year round, with no protection except for the motor housing.

If you're in this business, Brother, it might pay you to have a good long look at what a Sturtevant can do for tight aggregate specifications.



Sturtevant Air Separators classify production loads up to 150 tph by exact control of air currents and centrifugal force. Simple, quick adjustments make possible the selection (or rejection) of particles in the 30 to 400 mesh range. Nine standard models available, varying in size from 3′ to 18′.

Learn how a Sturtevant Air Separator can help your aggregates production. Write today describing your needs. Address: Sturtevant Mill Co., 102A, Clayton St., Boston 22, Mass.

STURTEVANT AIR SEPARATORS CLASSIFY SAND WITHOUT WATER

PRODUCING CLEAN SAND, the Sturtevant acts as a de-duster by removing fine mesh particles from the throughput. Particularly valuable where water is limited.

EASING SCREEN LOADS, the Sturtevant rejects unwanted fines and circuits coarser sizes to screens for grading. By this pre-classification, the possibility of blinding screens with fines is minimized and output considerably increased. Also, excessive dust problems are eliminated.

WHEN BLENDING IS NECESSARY, the Sturtevant selects fines from the crushing operation. This stockpiled product then can be used in the blending operation to overcome fineness modulus deficiencies.

GRINDERS
CRUSHERS
PULVERIZERS
MICRON-GRINDERS

STURTEVANT MILL CO.

Dry Processing Equipment

MIXERS
BLENDERS
ELEVATORS
AIR SEPARATORS

The "OPEN-DOOR" to *lower* operating costs over *more* years

Enter 1402 on Reader Card

INDUSTRY NEWS

(Continued from page 49)

Harbor mishap delays greeting

CEMENT DESTINED for construction of the Dundee Cement Co. plant, Dundee, Mich., did not receive quite the civic welcome planned for its arrival at Monroe, Mich. The 2,000-ton cargo, arriving on the Shirley G. Taylor, a Toronto freighter, was to have received an official reception on the dock. When the freighter scraped bottom 35 ft. from shore, the welcoming committee had to row out to the freighter.

Office enlargement begun at Ohio plant

SOUTHWESTERN PORTLAND CEMENT Co., Los Angeles, Calif., began work this summer on an addition to the office building at its Fairborn, Ohio, plant. Floor space of the present office will be doubled, and modernization of the older structure also is planned. When the addition is completed, it will make the final building appear as a "T". Precast concrete and masonry will be used in the construction to give it a modern appearance.

Portland cement production

PRODUCTION OF FINISHED portland cement in June, 1958, as reported by the Bureau of Mines, totaled 30,078,000 bbl., an increase of 14 percent over June, 1957. Mill shipments for the month totaled 30,262,000 bbl., a 2-percent increase compared with June, 1957, and stocks on hand June 30, 1958 were 33,238,000 bbl., 11 percent more than the year-earlier figure. Clinker production during June, 1958, totaled 27,925,000 bbl., 14 percent more than the same month last year. The figures were provided by 162 plants in 37 states and Puerto Rico.

Lehigh starts operations at Everglades plant

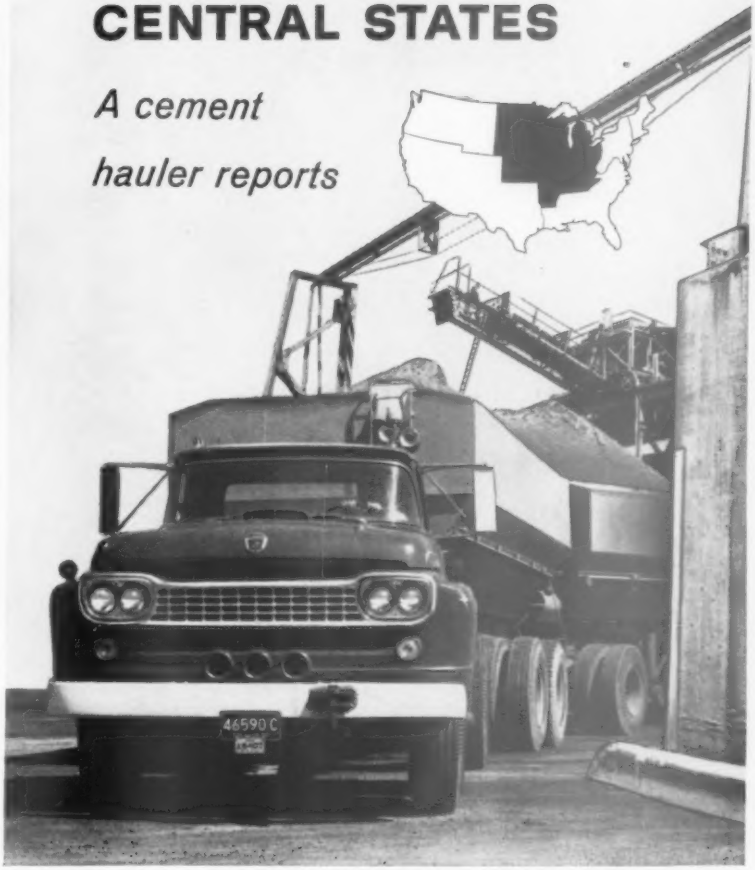
LEHIGH PORTLAND CEMENT Co., Allentown, Pa., began operations July 1 at its new cement plant in the Florida Everglades 7 miles west of Miami. The first clinker reached the end of one of the two 475-ft. rotary kilns at 6:12 p.m.

Lehigh's new plant was built on a 3,000-acre tract underlaid with coral rock which provides raw material. At full production, the capacity will be 2.5 million bbl. per year.

(Continued on page 53)

FROM THE CENTRAL STATES

A cement hauler reports



Carl Harrison, Inc., is a limited common carrier of bulk cement operating out of Dearborn, Michigan. The Ford F-1100 shown above is the biggest of the firm's six Ford trucks.

This F-1100 grosses 98-100,000 lb. pulling doubles. Payload is 64,000 lb. (170 barrels of cement). Company President Carl Harrison makes the point that the low curb weight of Ford trucks allows him to carry bigger payloads. "The curb weight of this Ford tractor is almost half a ton less than another make we have used on this job."

Carl Harrison's shrewd appreciation of efficient, economical equipment is further evidenced by the fact that his bulk cement semi-trailers are custom-built to his own design.

Additional specifications of this F-1100: 534-cu. in. Super Duty V-8, 5-speed transmission, 2-speed rear axle, 144-in. wheelbase.

"And as far as power is concerned, this big Ford has really got it. She saves time on every trip, time that means money to us."

Carl Harrison

President
Carl Harrison, Inc.

Enter 1408 on Reader Card



• Bituminous coal contributes to plant operating profits by its *productivity* and *stability*. Virtually limitless supply, plus most modern mining methods, gears production to *any volume demand.*

Accessibility and increasingly efficient burning equipment mean economical, constant-cost for today and tomorrow.

B&O

Ask our man! **BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400**

Enter 1401 on Reader Card

INDUSTRY NEWS

(Continued from page 51)

American Aggregates plans new operation

AMERICAN AGGREGATES CORP., Greenville, Ohio, has bought a 150-acre site near Fairborn where it will erect a $500,000 sand and gravel plant. William E. Hole, president, said the new plant, employing about 20 persons, will have an initial capacity of about 250,000 tpy. which may be increased to 500,000 tons.

Silo contract precedes cement plant construction

COLUMBIA-SOUTHERN CHEMICAL CORP., Pittsburgh, Pa., a division of Pittsburgh Plate Glass Co., has awarded a contract for construction of nine bulk loading silos to Macdonald Engineering Co. The contract is the first of the awards in connection with a new cement plant being designed by Macdonald Engineering Co. for erection at the existing rock crushing operation of Columbia-Southern's Barberton, Ohio, plant.

The nine silos have a capacity of 180,000 bbl. of cement. They are arranged in three rows with elevated bin bottoms so that trucks can be loaded by gravity under two rows of silos and be weighed while loading. Railroad cars will be loaded and weighed under the other row of silos.

Construction is scheduled for completion by December 31, 1958. Bulk cement will be shipped to them for storage from the Zanesville, Ohio, plant of Columbia-Southern, where new finish grinding capacity and additional plant modernization have just been completed.

Bureau of Mines tallies 1957 production statistics

FIGURES HAVE BEEN RELEASED by the Bureau of Mines, U. S. Department of the Interior, giving production totals for several materials in the rock products industry for the year 1957.

In the cement industry, production of portland cement was 6 percent less in 1957 than in 1956, decreasing to 298 million bbl. Production of prepared masonry cement decreased to 15 million bbl. in 1957 from 16 million bbl. in 1956. Production of natural and slag cements decreased 44 percent in 1957 from the year before, or to 631,000 bbl. Total value of all cement shipments was $978,731,000, averaging $3.21 per bbl.

Sand and gravel output climbed to a total of 627 million short tons, near-

(Continued on page 55)

FROM NEW ENGLAND

A nationally operated dairy reports



"Milk and dairy products make highly concentrated loads," says Elnathan Mitchell, President of Mitchell Dairy. "We need a bigger, stronger tractor than usual for our gross of about 50,000 lb. We decided to try a new Ford Tilt."

Mitchell Dairy, an affiliate of The Borden Company, has headquarters in Bridgeport and serves almost the entire state of Connecticut. The dairy's Ford C-1000 Tilt is on the job seven days a week, hauling canned and bottled milk from Bridgeport to outlying distribution plants.

This big Ford operates both in heavy city traffic and on expressways. Comments of drivers: "She makes it really easy to handle trailers in tight areas". . . "There's practically no shifting once she gets up to cruising speed". . . "Outpulls any tractor in the fleet."

Mitchell's Ford C-1000 Tilt Cab tractor has a 477-cu. in. V-8, five-speed transmission, 6.71/9.13 to 1 two-speed rear axle ratio, 99-inch wheelbase.

"We bought this Ford Tilt Cab truck chiefly because of its maneuverability and its low curb weight—over 1,000 lb. lighter than competitive tractors. That means our legal payload can go better than 30,000 lb."

Elnathan Mitchell

President
The Mitchell Dairy Company

Enter 1410 on Reader Card



This roller, hardfaced with Victoralloy, shows practically no wear after crushing 40 tons of rock hourly, 8 hours daily for 30 days.

HOW TO SAVE ON ROLLERS AND ROD

....*Use VICTOR Hardfacing*

Tracy Rock & Gravel Co., Tracy, Calif., crushes 40 tons of rock hourly, prolongs roller life on this rough work by rebuilding with ¼" VICTORALLOY #1 Bare Electric rod, 28" length. Says plant superintendent Albert Parker:

> "Victoralloy's ease of application and fast buildup mean a lot to us. There is no lost time as we use 28" length rod; when it burns down, we touch a new rod to the old one, and keep on welding without even lifting the helmet."

You, too, can save rod and increase working life of crusher rolls, screens, shovel teeth, tractor rollers and idlers, dredge pumps and many other parts subjected to abrasion and severe impact. Simply hardface with VICTORALLOY. It welds to manganese, steel or cast iron. You get all position hardfacing, exceptional arc stability, deposits free of porosity, fast application without slag interference. Try it. Order a supply from your VICTOR dealer TODAY.

• FREE •

Victor Hardfacing Manual shows you right rod to use and how to apply it.

Write us NOW for your copy.

Profitable dealerships open; inquire now!

VICTOR for hardfacing

VICTOR EQUIPMENT COMPANY

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

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(Continued from page 53)

ly 3 million tons over 1956. This included 463 million tons of sand and gravel by commercial producers and 164,661,000 tons by government and contractor operations. Total value of all sand and gravel production in 1957 was $593,785,000, averaging 95 cents per ton.

Lime production in 1957 amounted to 10,274,506 short tons, a 3-percent decline from 1956. Value of shipments was $135,322,835. Making up the production totals were 8,193,788 tons of quicklime and 2,080,718 tons of hydrated lime.

Domestic production of crude perlite reached 422,346 short tons in 1957, compared to 350,224 tons in 1956. Screened and sized crude, sold or used, was 301,605 tons with a value of $2,562,225, compared to 310,800 tons at $2,550,000 in the previous year. Expanded perlite sales decreased 7 percent to 245,433 tons valued at $12,511,467, compared to 263,627 tons at $13,122,473 in 1956.

Shipments of domestic fluorspar went down slightly in 1957, to 328,872 short tons, from 329,719 in 1956. Value of 1957 shipments was $15,776,888, averaging $47.97 per ton. Imports of fluorspar in 1957 amounted to 631,367 short tons, valued at $16,031,085. This compared with 1956 imports of 485,552 tons, valued at $11,224,968.

Table of excuses

HERBERT P. WAGNER, manager of the University of Michigan food service, has issued to his subordinates the following Table of Excuses: To save time for management and yourself, please give your excuses by number. The list covers most situations.

1. That's the way we've always done it.
2. I didn't know you were in a hurry for it.
3. That's not in my department.
4. No one told me to go ahead.
5. I'm waiting for an O.K.
6. How did I know this was different?
7. That's his job, not mine.
8. Wait till the boss comes back and ask him.
9. I forgot.
10. I didn't think it was very important.
11. I'm so busy I just can't get around to it.
12. I thought I told you.
13. I wasn't hired to do that.

(Reprinted from The Besser Digest.)

(Continued on page 57)

FROM THE MIDDLE ATLANTIC STATES

A dump truck operator reports



"I operate all over New York State," says owner-operator Wendell Wilbur, "and loaded or empty my Ford can beat any dump on the job."

Mr. Wilbur's big 1958 Ford T-850 has a 10-cu. yd. dump body, is powered by a 477-cubic inch V-8, grosses 50,000 lb. It is equipped with 5-speed main transmission, 3-speed auxiliary, and has a 156-inch wheelbase.

"I'm in this truck all day long," says Mr. Wilbur, "and it's the smoothest riding tenwheeler I've ever driven. And talk about handling!—with power steering my rig handles easier than a lot of pickups.

"This Ford's curb weight is almost 4,000 pounds less than other comparable trucks. That means more money-making payload for me."

Mr. Wilbur has been a truck user for more than twenty-five years, and he's been a Ford user just as long.

"My Ford T-850 has real power—on the hills I can pull away from any truck around—I even leave big diesels behind."

Wendell Wilbur

Owner-Operator
Ellenville, N.Y.

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MAGNECON*

meets the needs for hot zone linings

The refractory lining of rotary cement kilns must pick up and hold a sound coating. Whatever your burning temperature, silica ratio, frequency of mix changes or shutdowns, uniformity or otherwise of kiln feed analysis and load — the soundness of the protective coating on the hot zone lining is a vital factor in your production and operating economy.

Under the most varied conditions, "MAGNECON"* has proved its ability to pick up and hold a sound coating.

OTHER OUTSTANDING CHARACTERISTICS OF "MAGNECON" BRICK:

Resistance to chemical attack even under the highest operating temperatures.
Resistance to spalling under all operating conditions.
Unique chemical composition.

Please request full information from:

*reg'd. tradename.

CANADIAN REFRACTORIES LIMITED

CANADA CEMENT BUILDING, MONTREAL, CANADA.

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INDUSTRY NEWS

(Continued from page 55)

NLA project on air pollution

RECIPIENT of a National Lime Association fellowship at Purdue University, Weldon C. Fill, started a new project on air pollution last spring. Mr. Fill is a research fellow working for his master's degree, and will work under the direction of Don Bloodgood, professor of sanitary engineering. The work centers on use of lime in removal of sewer odors, primarily hydrogen sulphide. Considerable interest has been shown in this problem in Los Angeles, Chicago and Cincinnati.

Other research carried out in this field by C. W. Beardsley and associates was reported in *Sewage and Industrial Wastes*, February, 1958, titled, "Removal of Sewer Odors by Scrubbing with Alkaline Solutions." The article describes a pilot plant setup in Los Angeles, incorporating a rotary screen humidifier for treating sewer gas with various alkaline solutions. Sodium hydroxide was found to be the most effective alkali for removing odors, although it was indicated that lime probably would give the most economical results. Milk of lime, applied to 750 cfm. of sewer gas at 60 gph., reduced the H_2S content from 1.2 to .6 ppm.

Gives college grant

ALPHA PORTLAND CEMENT CO., Easton, Pa., has granted Lafayette College of Easton an additional $5,000 for masonry cement research, according to an announcement by John F. Magee, chairman of the board. This brings the amount of the company's masonry cement research grants to $10,000.

The grant will extend the study being done by William Zemaitis and will allow for field testing of mortar cements. The original research has shown that durability is the prime factor in field mortars. Findings were reported to a Symposium on Mortars of the ASTM.

Refractory manual

AMERICAN SOCIETY FOR TESTING MATERIALS, 1916 Race Street, Philadelphia 3, Pa., has brought out *Manual of ASTM Standards on Refractory Materials (C-8)*. It includes all 41 ASTM specifications, classifications, methods of testing, definitions and suggested procedures relating to refractories. Copies may be obtained from the society at $5.50 for a paper-bound volume or $6.25 in the cloth cover.

(Continued on page 61)

FROM THE SOUTHEAST

An over-the-road hauler reports



Estes Express Lines, of Richmond, Va., owns a 1958 Ford C-1000 Extra Heavy Duty Tilt Cab model. This rig is on the job 20 hours a day, piling up ten thousand miles a month.

Robey W. Estes, Vice President and General Manager, calls the performance he's getting from his new Ford Tilt "outstanding."

"The economy of Ford's 477-cubic inch V-8 compares very well with the 450-cubic inch sixes in our fleet," he adds. "The Ford performs better and doesn't use any more gas. We get over 5 miles per gallon, which is pretty good for our gross and our kind of hauling. The Ford also has a lot more power and speed. As one of the drivers told me—that Ford gets down the road mighty easy."

Estes Express's big Ford is a 1958 C-1000 tractor, with a 477-cubic inch V-8 engine. It has a 99-inch wheelbase, a five-speed transmission and a two-speed rear axle ratio of 6.14/8.36 to 1. Gross weight runs from 52 to 56,800 lb.

"Ford's Tilt Cab design gives us as much as 1800 pounds more payload than we could get with a conventional tractor. Drivers prefer the Tilt because of its comfort and maneuverability."

Robey W. Estes

Vice President and General Manager
Estes Express Lines

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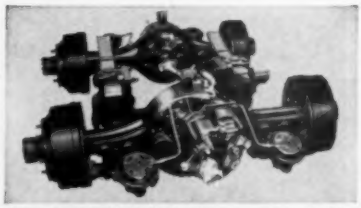
Whatever the job . . . wherever you do it!

There's more to look for in Ford's extra heavies for '59

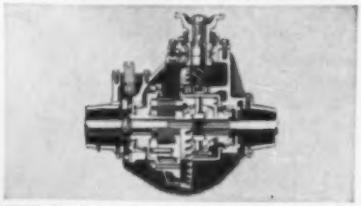
Ford Extra Heavies have proved themselves on every kind of job—you can count on them for *dependability* and *durability*. And in '59, you get high performance at low Ford prices for brand-new reasons! New faster rear axle ratios, new higher capacity axles, and other important options make big-truck operation still thriftier in '59 when you go *Ford*-ward. Send coupon for full information!



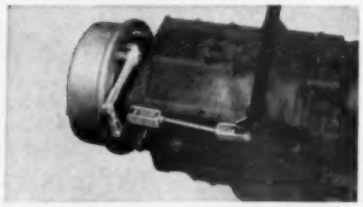
NEW Tractor Equipment Package provides complete trailer air brake and electrical connections, meets I.C.C. requirements.



NEW Ford Tilt Cab Tandems are available with three tandem-axle capacities: 28, 34, and 38,000 lb. Front axles to 15,000 lb.



NEW Faster Axle Ratios team up with Super Duty V-8's for greater gas economy and reduced engine wear. For example, 5.43/7.39 to 1 available in 1100 Series.



NEW 2-Shoe Brake (parking) is standard for '59 on all Ford Extra Heavies. Has 50% greater stopping and holding power, requires 50% less effort to operate.



Tilt Cab Tandem Ford C-950 (above) has hydraulic loader with push-button remote control.

Go FORD-WARD for savings FORD TRUCKS

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FREE—COMPLETE FACTS ON NEW EXTRA HEAVY DUTY TRUCKS
Check Choice of Booklets and Return to:
FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan

☐ **Extra Heavy Duty Conventional and Tilt Cab Trucks**
Up to 36,000-lb. GVW, 65,000-lb. GCW

☐ **Tandem Axle Models**
Up to 51,000-lb. GVW, 75,000-lb. GCW

Name_____

Address_____

City_____ State_____

BRAND-NEW TILT CAB TANDEM FORDS for '59 combine the easier, more economical maintenance of tilts with high tandem-axle load capacities. Tilt design also permits higher front axle loads, longer body on given wheelbase. C-950 Tandem, above, operated by Fairlawn Supply and Concrete, Akron, has 15,000-lb. front axle, 34,000-lb. rear. Carries up to 6,500 brick, compared to 5,000 on a conventional tandem. Has 401-cu. in. V-8, 5-spd. main transmission, 3-spd. auxiliary, 201-in. wb. GCW (with pup trailer) 72,000 lb.

COST LESS ... *less to own ... less to run ... last longer, too!*

HURRY-UP HAULER!



LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work in narrow cuts. PR21's special steel withstands impact, abrasion and corrosion—has the stamina to keep production up.



ROLL FAST! DW21 Super-Turbo Engine develops 28% torque rise and 320 HP (maximum output); tractor has top speed of 27.9 MPH. The PR21 has 22.5 cu. yd. heaped and 62,000 lb. capacity. All add up to fast cycles, top production.



DUMP FAST! PR21 has hydraulic hoists for quick and complete 60° dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure-footed traction.

CAT DW21-PR21 UNITS AVERAGE 5 TRIPS AN HOUR ON 1-MILE ROUND-TRIP HAULS

This is one of the DW21 (Series C) Tractors with Athey PR21 Rear Dump Wagons used by the Yahola Sand & Gravel Co., Fort Gibson, Oklahoma. The units haul gravel from the Grand River to the plant. Each handles an average load of 22 cu. yd. and makes the 1-mile round trip in 12 minutes cycle time. With short turning radius, high cruising speed and fast dumping action, they keep production on schedule day after day during a 6-day week.

Now a new DW21 (Series D) is matched to the 22.5-cu.-yd. PR21 for fast, heavy-duty work. The new DW21 features the Caterpillar Super-Turbo Engine that delivers 320 HP (maximum output) . . . and a 28% torque rise—twice as much as ever before, to handle the roughest terrain.

The Super-Turbo incorporates an important advance in tractor diesel engine turbocharging—a new air induction system. This system allows use of more of the Turbocharger's potential than was possible before. Results: a big torque rise, higher horsepower, better acceleration and gradeability. But more important, faster cycles, greater production and more profit—*for you.*

Let your Caterpillar Dealer show you how the new DW21-PR21 can step up production and lower costs. He has facts to prove it's a good investment—an investment that he backs with round-the-clock service. Ask him to demonstrate on your job. Just say when and where—he'll be there!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

INDUSTRY NEWS

(Continued from page 57)

Court denies part of Monolith's depletion claim

AN UNFAVORABLE percentage depletion decision was made by the U. S. District Court, Los Angeles, in the case of Monolith Portland Cement Co. The company had filed for a refund for the year 1951 at the 15-percent rate of percentage depletion on the basis that their stone was chemical grade limestone. The court held that:

1. Chemical grade limestone is one which is of relatively high calcium carbonate content.

2. The taxpayer's rock used for making cement had an average of 85.2 percent calcium carbonate and was not a chemical grade limestone. Therefore, it was entitled to only a 10-percent rate of depletion as calcium carbonate, rather than 15 percent.

3. Since 63.5 percent of the company's sales were of bulk cement, this was found to be the commercially marketable mineral product and the bagging costs were excluded from consideration as an ordinary treatment process.

4. Other costs excluded from computation of net income were royalties, trade discounts, trucking costs—both contract and with owner's trucks, rail freight and warehouse and bulk storage plant costs at distribution points away from the company's cement plant.

In bringing these facts to the attention of members of National Agricultural Limestone Institute, President Robert M. Koch commented: "Inasmuch as this case was heard in the District Court, it is probable that the decision will be appealed to a higher court. Insofar as we are aware, this is the first unfavorable court decision since cases of this nature have been contested in court."

Silos completed; last step in Diamond's expansion plan

DIAMOND PORTLAND CEMENT CO., Middle Branch, Ohio, completed construction of four 162-ft. high concrete loading stations in 8½ days recently, as the final step in its $5-million expansion program. Macdonald Engineering Co. used the slip-form method for pouring the concrete. The stations, erected at a cost of $605,000, will permit loading and weighing of bulk cement trucks in 6 to 7 minutes. Total capacity of the four silos is 100,000 bbl. of cement.

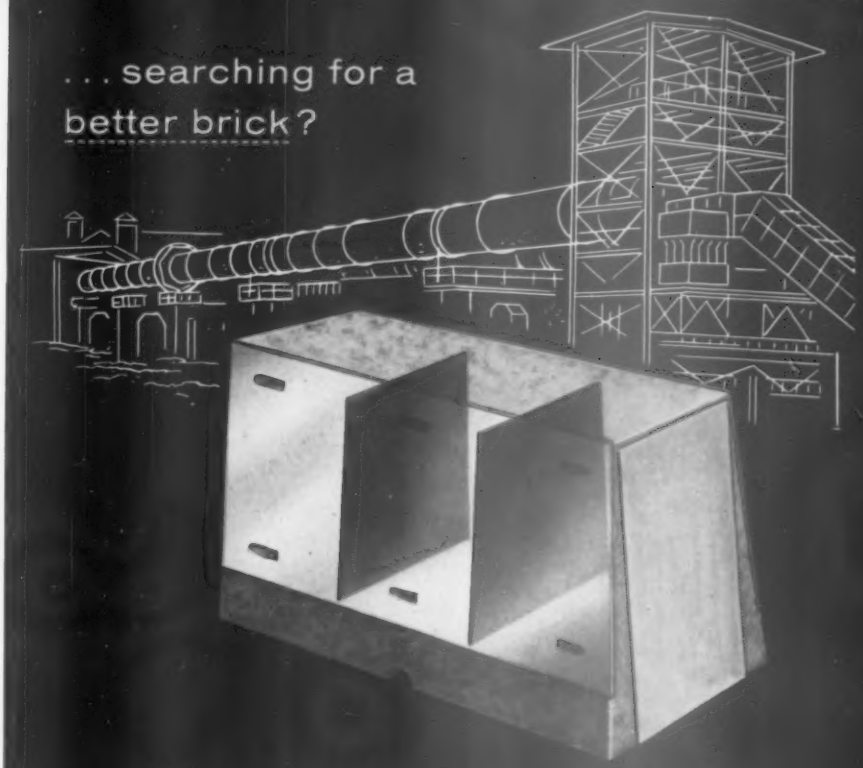
Each silo is 33 ft. diam. with 10-in. walls.

END

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. . . searching for a better brick?



STEELKLAD-EE

the original internally plated brick . . .

Burning zones of portland cement rotary kilns—seared by tongues of flame 30 or 40 ft. long and handling routine temperatures of 2800°F. or more—pose supremely tough tests for refractories.

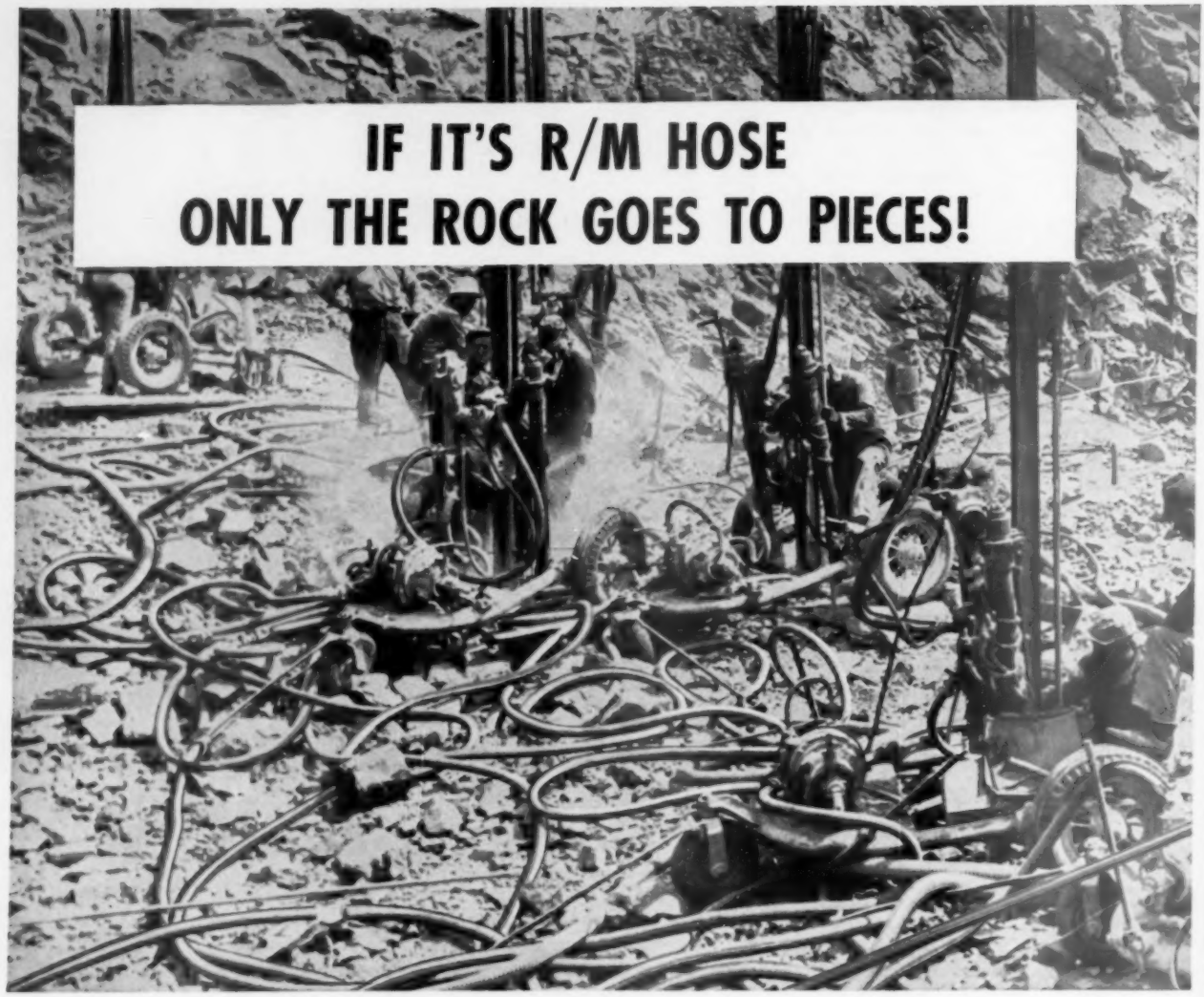
In STEELKLAD-EE (the newest type of basic refractory brick with steel plates bonded to it as integral parts) Grefco has produced for the cement industry a superior refractory with significant advantages:

1. *Lower thermal conductivity than burned brick*
2. *Increased spalling resistance*
3. *Positive taper identification*
4. *Double steel plates in radial joints*
5. *Superior coating characteristics (for faster clinker coating build-up, longer life)*
6. *Built-in expansion allowance (cardboard expansion strips attached)*

The cut-away view above shows how STEELKLAD-EE's exclusive internal bonding molds the steel plates right into the brick itself, making three bricks of one. These smaller refractory units are better able to withstand the punishing cycles of heating and cooling—mean longer life, fewer shutdowns. STEELKLAD-EE is a *better brick*, any way you view it!

GENERAL REFRACTORIES COMPANY
Philadelphia 2, Pa.

• Please consult your local Grefco representative for advice on any of STEELKLAD-EE's numerous applications. STEELKLAD-EE brick is available from Grefco plants in Baltimore, Gary, Los Angeles, and in Smithville, Ontario.



Long Life features of HOMOFLEX HOSE Assure

for Your

"More Use ~~per~~ Dollar"

Rugged Homoflex Hose is R/M's exclusive construction for use with air, water, other fluids and gases. Strong enough to stand up under the toughest conditions, yet light in weight and flexible as a rope for easier handling . . . even on the roughest, rockiest job site. Exclusive R/M features make Homoflex Hose do a *better* job . . . and *last longer.*

- Mandrel-Made — No Pre-Set Twist, Extremely Flexible
- Inseparable Cover, Strength Member and Tube
- Coils and Uncoils Freely in *Any* Direction, Resists Kinking
- Balanced Homogeneous Construction Throughout
- Uniform Inside and Outside Diameters — Easier Coupling
- Withstands High Pressures and Surges with Wide Margin of Safety

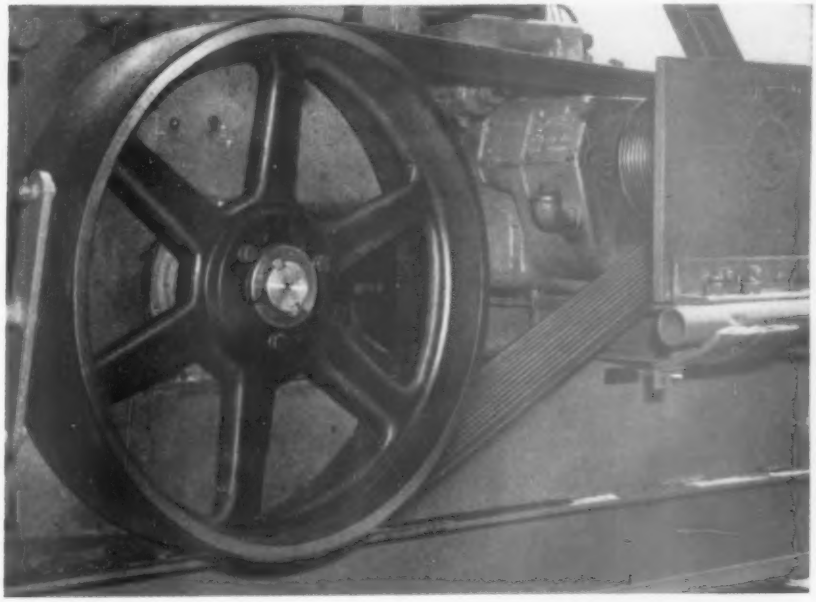
R/M has a hose construction engineered to meet *every* job requirement. Write for Bulletin #6879.





RAY-MAN CONVEYOR BELT— Tough, flexible Ray-Man resists gouging and tearing. Double compensation relieves stress on outer belt plies . . . assures longer belt life and lower cost. High fastener holding ability. Other types available for every bulk materials handling requirement. Write for Bulletins.

R/M POLY-V® DRIVE— New, patented heavy duty drive delivers up to 50% more power in the same space as conventional multiple V-drive . . . equal power in as little as ⅔ the space. Single unit V-ribbed belt design eliminates multiple-belt "length matching" problems. More constant speed ratios, less wear on belt and sheaves, smoother running. Write for Bulletin #6638.





*Poly-V is a registered Raybestos-Manhattan Trademark.

RM 802

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

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LOOKING FOR A SAFE BUY IN USED EQUIPMENT?



This sign identifies the *safest buy* in used equipment—a "Bonded Buy" offered by your Caterpillar Dealer. Safest because you get a Guarantee Bond of up to $10,000, assuring you of satisfactory performance of all parts when you make a "Bonded Buy" on any used Cat-built machine.

Your Caterpillar Dealer also offers a "Certified Buy" with his written guarantee covering units of any make. Or a "Buy and Try" deal, which carries a written money-back agreement.

For the safest buys in today's used equipment market, see your Caterpillar Dealer today.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR

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BEST BUY IN NEW AND USED EQUIPMENT

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Calendar of Coming Conventions

1958

October 9-11, 1958—
National Lime Association, Fall Operating Meeting, Hotel Cleveland, Cleveland, Ohio

October 13-18, 1958—
National Industrial Sand Association, Fall Meeting, The Greenbrier, White Sulphur Springs, W. Va.

October 16-18, 1958—
Empire State Sand, Gravel and Ready Mix Association, Fall Conference, Concord Hotel, Kiamesha Lake, N.Y.

October 20-24, 1958—
National Safety Congress, 46th Annual Convention of National Safety Council, Cement, Quarry & Mineral Aggregates Section, Conrad Hilton Hotel, Chicago, Ill.

October 21-22, 1958—
National Slag Association, 41st Annual Meeting, The Mayflower Hotel, Washington, D.C.

October 23-25, 1958—
Mid-America Minerals Conference (AIME), St. Louis, Missouri

November 18-20, 1958—
National Conference on Air Pollution, Sheraton-Park Hotel, Washington, D.C.

1959

January 20-21, 1959—
National Agricultural Limestone Institute, 14th Annual Convention, Hotel Statler, Washington, D.C.

January 22, 1959—
National Crushed Limestone Institute, 4th Annual Convention, Hotel Statler, Washington, D.C.

January 27-30, 1959—
National Crushed Stone Association, 42nd Annual Convention, Bal Harbour Area Hotel Group, Miami Beach, Fla.

February 2-6, 1959—
American Society for Testing Materials, Committee Week, Penn-Sheraton Hotel, Pittsburgh, Pa.

February 15-19, 1959—
National Sand and Gravel Association, 43rd Annual Convention, Hotel Roosevelt, New Orleans, La.

April 6-8, 1959—
National Lime Association, Annual Convention, Homestead, Hot Springs, Va.

June 21-26, 1959—
American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

Enter 1434 on Reader Card

CAT D8 TRACTOR-NO. 463 SCRAPER DIGS PROFITS OUT OF ALABAMA QUARRY



Cat D8 Tractor-No. 463 Scraper stripping overburden in mining operation near Tarrant, Ala. The haul averages 300 ft.

"I like the performance of our Caterpillar equipment," says John N. Cushman, general superintendent of the Dolcito Quarry Co., Tarrant, Ala.

Mr. Cushman is praising a Caterpillar team that is daily producing in excess of 2,000 tons of dolomite used for concrete aggregate, agricultural limestone, fluxing stone and rock dust.

A Caterpillar D8 Tractor with No. 463 Scraper strips overburden that ranges from 12 to 28 ft. thick. A Marion Back Hoe powered with a Cat D315 Engine assists in this function. The stone then is shot at a depth of about 50 ft., and a D7 pushes the rock to the quarry floor.

The D8-No. 463 combination is ideal where power and traction are needed for a short haul. The No. 463 Scraper, with all the fast, easy loading characteristics of LOWBOWL design, has a capacity of 18 cu. yd. struck, 25 cu. yd. heaped. It has straddle-mounted rear wheels with adjustable axles, high apron lift, protected cables—all the features that have made Caterpillar LOWBOWL Scrapers famous for high production.

The D8 packs 191 flywheel horsepower and 155 HP at the drawbar. It's tough, from track shoes hardened by a "water-quench" process to rugged diesel engine that uses low-cost fuels without fouling. And you have your choice of two models: torque converter drive and direct drive with the exclusive Caterpillar oil clutch.

Your Caterpillar Dealer has facts and figures showing how these big yellow machines can make a quarry operation more profitable. Ask for a demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

FIND YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

THE NO. 1 TRACTOR-SCRAPER COMBINATION



GIFFORD-HILL CO., INC., operates three General Electric locomotives at their Irving, Texas, SW Construction Materials Div. Plant No. 1. The 45-tonner above has been in operation since 1953 hauling heavy loads and saving money for the customer.



THE GRANITE ROCK COMPANY in Aromas, Calif., moves up to 6,000 tons of rock a day with their powerful G-E 65-ton loco-

PUTTING PLANT TRACKS TO WORK . . .

General Electric Locomotives Help Move 13,500 Tons of Crushed Rock a Day For Three Rock Products Companies



motive installed in 1951. Unit operates more than 2000 hours a year . . . has required no major maintenance.



SERVTEX MATERIALS COMPANY moves approximately 100 railroad cars a day at their New Braunfels, Texas, quarry and rock crushing plant. They have sharp curves and grades up to 3 percent. Servtex finds that their G-E 65-tonner can stand the pace.

The operations carried on by the three rock products companies pictured above have two things in common: getting rock in for processing . . . getting finished material out and on its way to customers. These three companies rely on General Electric industrial locomotives for these vital operations. They agree that:

G-E LOCOMOTIVES SAVE MONEY because they require little maintenance, use low-cost fuel, have no complicated, expensive-to-repair gears and transmissions, and are available up to 95 percent of the time for just about the most rugged duty ever demanded of any materials handling vehicle.

G-E LOCOMOTIVES ARE FAST AND EFFICIENT. A press of the starter button puts a G-E diesel electric on the job. High tractive effort—just the kind of power needed for handling heavy material—is readily available. Locomotives are doubly efficient because they let these companies put their existing tracks to more profitable work.

G-E LOCOMOTIVES GIVE LONG LIFE because General Electric industrial haulage specialists work with you to select the right locomotive to meet your haulage requirements. Complete parts and parts service is as close to you as your nearest G-E Apparatus Sales Office.

IF YOU NOW HAVE TRACK OR IF YOU ARE CONSIDERING A NEW PLANT SITE, ASK FOR A FREE SURVEY THAT WILL SHOW HOW YOU COULD SAVE WITH A GENERAL ELECTRIC LOCOMOTIVE. For a free survey now of your haulage needs, call your nearest General Electric Apparatus Sales Office. It's listed in the white pages of your telephone directory. General Electric Co., Locomotive & Car Equipment Dept., Erie, Pa. 120-100

Progress Is Our Most Important Product

GENERAL ELECTRIC

HINTS AND HELPS

Profit-making ideas developed by operating men

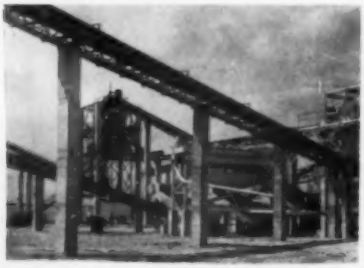


Keep equipment busy as much as possible

HERE'S ONE LIMESTONE PRODUCER who believes in keeping his equipment busy all the time and sometimes comes up with ingenious ways of using the machinery to good advantage. His extensive network of haulage roads justified the use of a road grader, but the infrequent blasts in the quarry couldn't pay for a bulldozer to keep the toe of the pile cleaned up.

With the grader fitted with a dozer blade, it does a bang-up job of pushing the shot rock back toward the face and clearing a way for haulage trucks. This occasional job done, the machine returns to its regular chore of road maintenance.

Conveyor supports



WHERE READY MIX concrete is available and inexpensive, concrete is invaluable for the rock products producer. Here, a southern crushed stone producer uses straight vertical piers of concrete to support his belt conveyor frames. These supports require no painting or maintenance; they make rigid, sturdy and permanent supports for the conveyors.

Counterweight belts from old oil drums

COUNTERWEIGHT DEVICES are essential for the satisfactory operation of most long and inclined belt conveyors. But it is not always easy to make a weight that is convenient to handle or easy to secure to the takeup pulley on the conveyor.

The plant manager of one midwestern sand and gravel producer used old oil drums to make highly effective counterweights. Using each drum as a concrete form, he poured just the right amount of concrete into each to approximate the manufacturer's recommended weight. Any additional weight can be easily added with more concrete, or as at this plant, with a few shovels of sand.

Steel containers are readily secured to the conveyor by wire rope passed through holes cut near the top edge of the drum. However, the wire rope could be cast into the concrete just as easily, making a permanent fixture.

Water and oil don't mix

ONE OF THE PESKIEST PROBLEMS facing the rock products producer who stores gasoline, diesel fuel or heating oil is the tendency for these petroleum products to pick up moisture. Since water sinks to the bottom of the container, it eventually collects enough to rust holes through the heaviest tank.

To overcome this problem, many operators arrange the outlet or tilt the tank to avoid the accumulation of water. But it is difficult to prevent condensation during frequent changes of weather and infrequent emptying of the tank. Several producers we have seen have rigged up a sight glass in the fuel line. When this glass container becomes full of water it is time to stop drawing fuel and empty the glass, keeping water out of machinery tanks.

Belt conveyor safety



JUST EVERY ONCE in awhile this belt conveyor at a Canadian cement plant would pick up a couple of extra oversize pieces of limestone at the transfer point. Then the large piece on top would roll back down the conveyor until it found a place to stay. Unfortunately, many of these pieces kept rolling back to the loading point.

A very simple device solved the

(Continued on page 72)





Where men and hose flex their muscles

Here's the hose that's as rugged as the men who use it. On the really tough construction jobs—where tight quarters, abrasive terrain and high working pressures take their toll of ordinary air hose—mandrel-made, wrapped-finish, U.S. 4810 Air Hose stands up to use *and abuse*.

Yet, despite its great strength, 4810 is no muscle-bound hose. "U.S." engineering has made it easier to handle, readily flexible, able to take higher working pressures—*and less expensive*—than the conventional air hose you might be using. It's one of a complete line of U.S. Rubber construction hose.

• • •

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

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Mechanical Goods Division

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7 yd struck

9.5 yd heaped

155 horsepower

5 speeds to 25.4 mph

12-ton payload

Measure these advantages for

22 hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul construction jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.



Measure these features . . . Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers.



a wide range of earth-moving jobs...

Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job . . . when required, transport wheels are available to meet legal load limits for highway travel.





ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

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HINTS AND HELPS

(Continued from page 68)

problem. A piece of 2 x 10-in. rough timber was suspended in the throat of the loading chute to skim off any rock perched on top of the loaded belt. The timber swings freely enough not to cause any resistance to the belt, but it does a good job of settling the heavy rock into the bed of material and preventing runaway stone.

Extra tooth for shovel



A LOT OF SAND AND GRAVEL producers have well-consolidated material which simply won't come down to a shovel. The stuff is too soft to blast and will sometimes collapse of its own accord right on a shovel or truck.

A midwestern operator overcame this hazard in his pit by rigging up a "digging tooth" for his shovel. Then when the bank gets too steep or overhung for safe digging the sharp prong placed in the bucket of the shovel brings down the bank.

The device is simply a pair of old rails welded to form a triangle whose base is just wide enough to fit the bucket snugly. About 10 ft. long, it gives the shovel operator enough "reach" to bring the bank down without submerging his rig.

Belt lagging

THE VERY BEST WAY to buy lagging for head pulleys is to order screwed or vulcanized lagging direct from the factory, but this is not always possible when an operator wants to continue using existing equipment for a bigger job.

A midwestern rock products producer solved the problem of getting more traction out of an existing head pulley by putting on lagging strips cut from heavy industrial abrasive cloth. Each strip is only a couple of inches wide but is easily secured to the face of the pulley with waterproof cement and a few lag screws.

This method provides plenty of traction for transmitting a lot more horsepower from the drive shaft to the belt without the usual tendency for a too-small pulley to slip under overload.



Conveyor walkways

WALKWAYS ALONG CONVEYORS are always sources of safety hazards, for they must be rigid, nonslipping and self-draining. It is not easy to find inexpensive materials which fill the bill, and this may account for the wide variety of walkway designs available.

This southern producer found a perforated plate available locally which proved to be ideal. Strips of galvanized perforated plate which were widely used for guard rails along highways proved to be stiff enough yet workable for installation as walkways. The perforations did not collect sand or gravel and allowed rainfall to drain readily, and it was simple for workmen to install.

Conveyor belts are useful, even when worn

FEW PIECES OF EQUIPMENT pile up around a producer's plant faster than sections of old belt conveyor, and they have found innumerable ingenious uses. Naturally, any sections of belt not worn excessively can be reclaimed to use as emergency splices to patch or extend a newer belt.

Many producers use old belts to reduce fatigue for workers who must stand or walk on concrete or on expanded metal platforms. This must be done with care, for many rubber surfaces become slippery when wet.

An ideal place to use old belting is to protect steel surfaces from abrasive or impact wear. Many chutes, spouts and hoppers are equipped with rubber belting which is bolted into place. Rubber belting can be hung at the discharge points of belt conveyors to help absorb the impact of sand, gravel or stone. Discharge spouts of bucket elevators can be lined for the same reason.

One of the most common uses seen in producers' plants is for skirt board liners on belt conveyors. However, unless very carefully installed, pieces of old belting can do more damage to new belt conveyors than they are worth by wearing grooves into the surface of the moving belt. For this purpose commercial soft rubber strips would be most economical.

END

Draglines get a workout in the Miami area

ONE OF THE BIGGEST concentrations of walking draglines in this country is in the Miami area where their huge booms dominate the landscape.

While these big pieces of equipment can be used to strip overburden and to prepare the site for production, their most effective use is to excavate from the waterline to nearly 50 ft. below water.

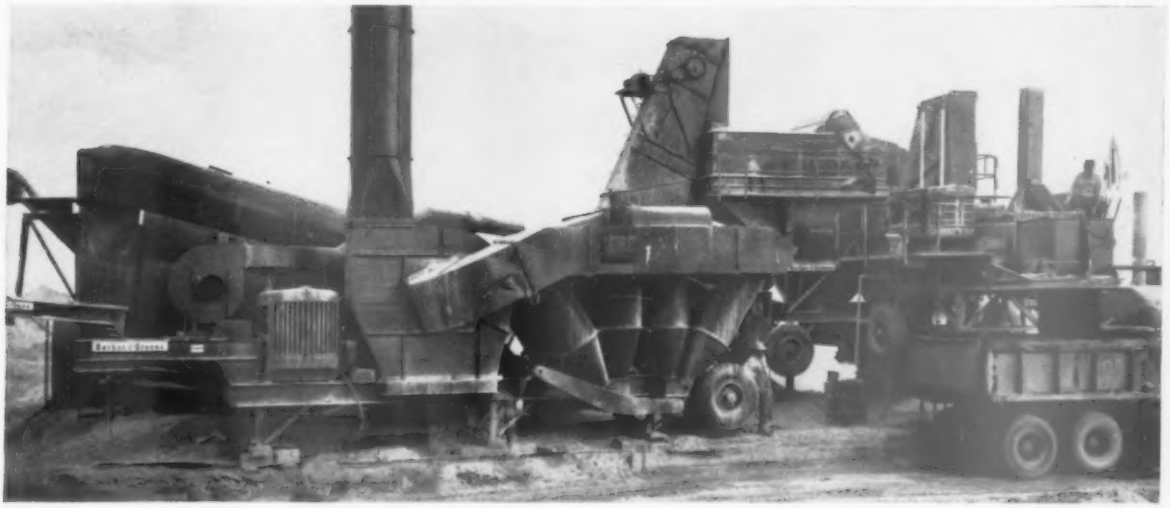
The first 20 ft. of the rock below water is prepared by drilling 2-in. holes on 8-ft. centers and shooting 5 holes at a time, each loaded with 25 sticks of 60 percent gelatin. The walking draglines easily remove the broken coral rock and pile it in windrows for pile draining before hauling to the screening plant.

The dragline is used also to place the dynamite which breaks up the lower formations. Underwater blockholing is practiced to blast the under-

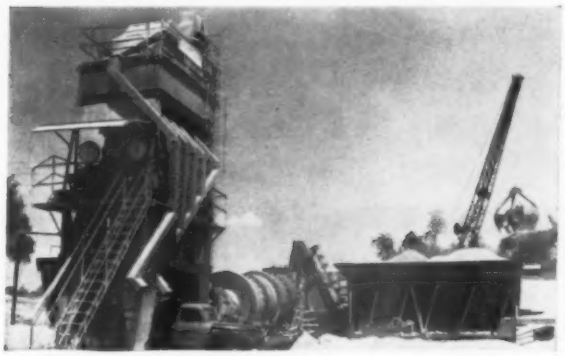


water strata, using 15 sticks of dynamite tied into bundles. These packages are lowered into place with great care and precision with the dragline bucket. The shots, which are electrically detonated, have produced excellent results in the hard, tough, deep rock deposits.

Machines of tomorrow ready to cut your costs today



With capacities from 20 to more than 200 tons per hour, Barber-Greene Continuous Asphalt Plants offer unmatched portability, automatic operation, interlocked proportioning, and the ability to meet the most exacting specifications. The human element is eliminated, and manpower requirements reduced to the minimum. Erection consists merely of spotting the units at the job site and jacking into position.



The only batch plant designed for truly automatic operation, Barber-Greene BatchOmatic simultaneously measures all sizes of aggregate and eliminates the human element in achieving accuracy and maximum capacity. Instantly switched from automatic to manual operation and from manual to automatic. New Dyna-Mix pugmill gives thorough coating in less time than any other batch pugmill made. Instant, positive inspection of aggregate gradation and weight. Wide range of various sizes. Complete line of components for every mixing requirement.



The new Model 879-B Finisher is establishing even higher standards of speed, accuracy and economy. Latest improvements include greater receiving hopper capacity, new transmission for faster operating and travel speeds, higher-speed tamper for faster laying speeds, new crawlers which further decrease maintenance costs, and new power unit with 20% more power for pushing even bigger trucks and handling even steeper grades. Automatic leveling and independent tamper combine to produce a level surface that will stay level under rolling and traffic

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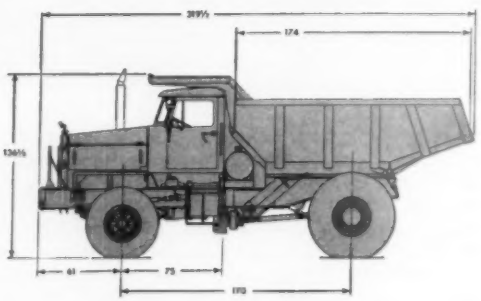
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MACKS FOR EVERY

MACK MODEL LVX

As a 22½-ton rear dumper, the off-highway LVX offers maximum payloads at minimum unit cost. With either a 320- or 335-h.p. diesel engine, an over-gear transmission with two-speed compound or torque converter, and Mack's Planidrive rear axle . . . the LVX is a top performer under all operating conditions. Maximum driver efficiency is assured by such features as ideal steering wheel position, power steering, two-plate air-assisted clutch, and Mack offset cab with extreme left driver position offering maximum view front and rear. From top to bottom, this Mack has the features that have made it the popular "big boy" for heavy construction.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 22½ tons.

DIESEL ENGINES: 320 h.p., supercharged Cummins; 335 h.p., turbocharged Cummins.

TRANSMISSIONS: Mack, selective, constant mesh, 8 speeds forward, 2 reverse; converter and Mack 4-speed transmission; Torqmatic converter and transmission.

CLUTCH: Mack two-plate, air assist with manual actuation.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gears within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Alloy steel, wide flange I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 14.00-24 (16P) rib or 14.00-24 (20P) rib; rear, 18.00-25 (24P) lug.

WHEELS: Cast, spoke.

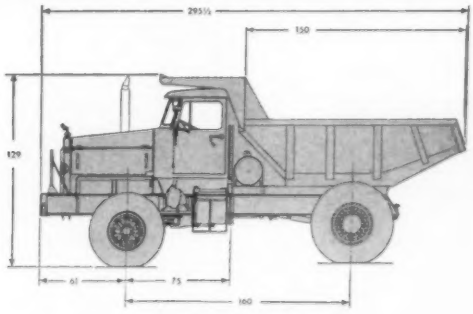
STEERING: Hydraulic power steering, 62' turning circle diameter.

DUMP HOIST: Twin, double-acting, outboard mounted, three-section telescopic cylinder assembly, providing 70° dumping angle.



CONSTRUCTION JOB

excavating...
filling...
equipment hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 15 tons.

DIESEL ENGINES: 172 h.p., naturally-aspirated Mack Thermodyne; 220 h.p., naturally-aspirated Cummins; 205 h.p., turbo-charged Mack Thermodyne.

TRANSMISSION: Mack, selective, constant mesh, 10 speeds forward, 2 reverse.

CLUTCHES: Mack single-plate, 253 sq. in. engagement (for 170 h.p. Mack Thermodyne); Mack two-plate, 416 sq. in. engagement for other sizes.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gear train within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Wide flange, rolled section I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 12.00-24 (16P) rib, 13.00-24 (18P) rib; rear, 14.00-24 (18P) lug, 16.00-25 (20P) lug.

WHEELS: Cast, spoke.

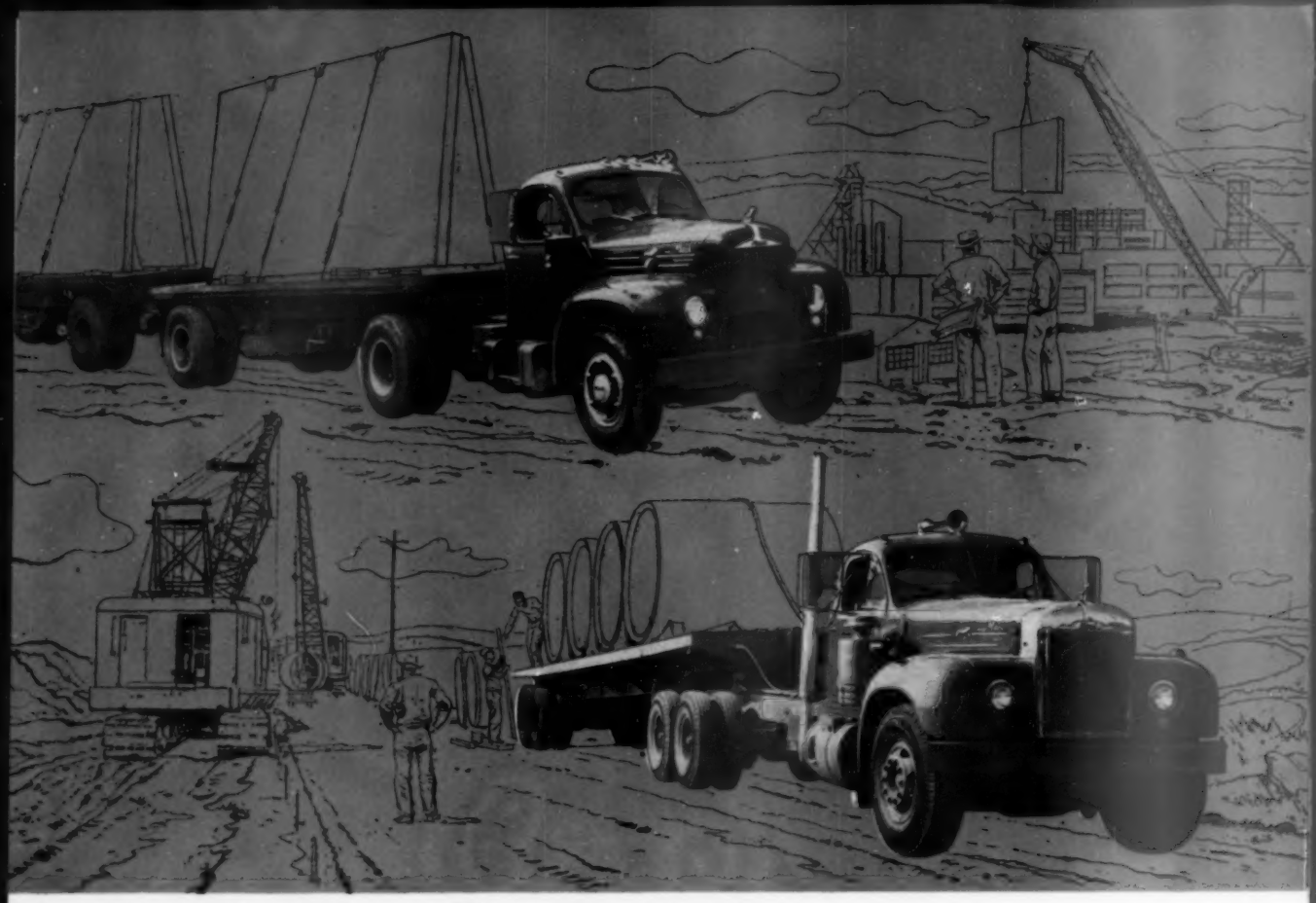
STEERING: 60' turning circle diameter.

DUMP HOIST: Twin, double-acting, 8" cylinders providing 70° dumping angle.

MACK MODEL LRX

The 15-ton LRX offers outstanding maneuverability with off-highway stamina and capacity. Powered with either a Mack or Cummins diesel engine and equipped with a Mack ten-speed transmission and Planidrive rear axle assembly, the LRX is an efficient performer on long hauls as well as steep grades. Powerful air brakes, carefully engineered cab, and rugged unified frame assembly have long made the LRX a popular model for earth or rock hauling.

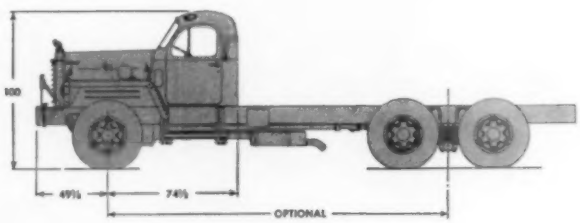
For capacities of 30 tons or more where maximum flotation is required, a full line of tandem rear axle Macks is available.



MACKS FOR EVERY

MACK B-80 SERIES

B-80 tractors for heavy-duty flat bed and dump trailer hauling, and B-80 truck chassis for large capacity dumper, mixer, and stake body operations have run up an unequaled record for economy and dependable service in all phases of construction work. Available in four- and six-wheel models including six-wheel drive models, B-80's are powered with 170 to 232 horsepower Mack Thermodyne gasoline or diesel engines, or with Cummins diesels in the 220 to 320 horsepower class.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 6 to 12 cubic yards; mixer, 7½ to 8½ cubic yards (6-wheelers) (larger with special provision).

ENGINES: Gasoline: Mack Thermodyne, 232 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p., with turbocharger. Cummins, 220 h.p.; 320 h.p., with supercharger.

TRANSMISSIONS: Mack: Five-speed, direct or overgear. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

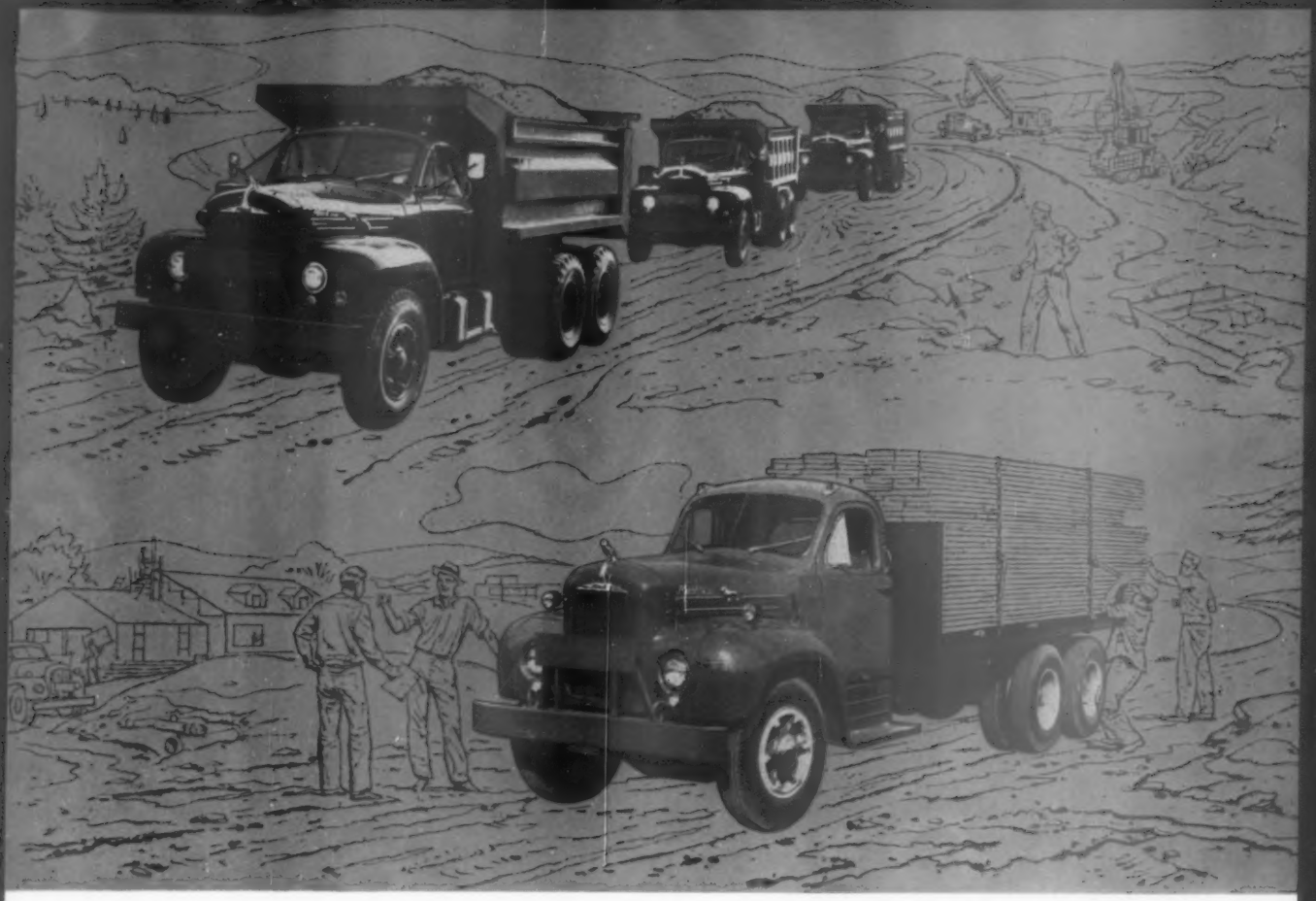
FRONT AXLE: Mack, heavy-duty, drop-forged I-beam. Mack, front wheel drive, for 6x6 chassis.

REAR AXLES: Four-wheelers: Mack Dual Reduction, with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated; channel reinforcement, standard.

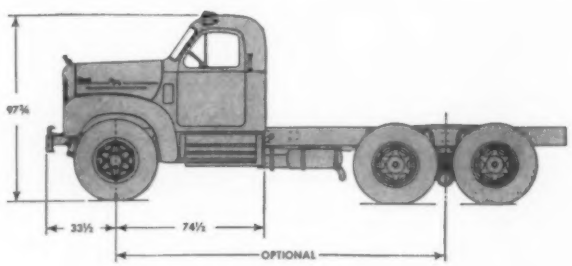
TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler); 11.00-22, 11.00-24, 12.00-24 (Six-wheeler). Size availability contingent upon bogie.

STEERING: Hydraulic-power steering (optional extra).



CONSTRUCTION JOB

aggregate and materials hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dump, 6 to 12 cubic yards; mixer, 5½ to 7½ cubic yards (6-wheelers).

ENGINES: Gasoline: Mack Thermodyne, 185 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p. with turbocharger.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off; ten-speed and auxiliary. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Three available sizes.

REAR AXLES: Four-wheelers: Mack Dual Reduction—with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider. Three bogie sizes available.

FRAME: Channel: Alloy-steel, heat-treated, pressed; channel reinforcements for maximum services (standard or optional extra).

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler). 10.00-20, 10.00-22, 11.00-20, 11.00-22, 11.00-24 (Six-wheeler). Size availability contingent upon bogies required.

STEERING: Hydraulic-power type (optional extra).

MACK B-60 SERIES

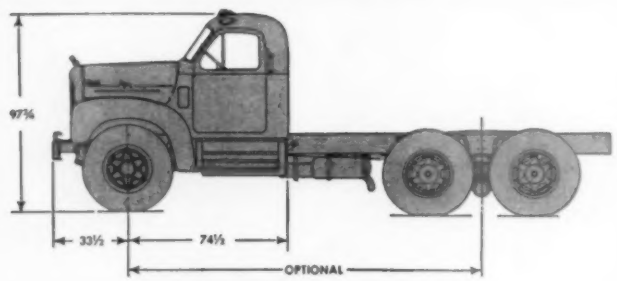
As dumpers, mixers, tractors, and flat-bed trucks, Mack B-60's are the acknowledged workhorses of contractors everywhere because of their dependable and efficient performance for a wide range of jobs. They are powered with Mack Thermodyne gasoline or diesel engines in either the 170 or 205 horsepower range. Both four- and six-wheel units are available. Six-wheel models use the exclusive Mack Balanced Bogie with interaxle Power Divider, the sure-footed drive that directs power more to the wheels having the greater traction.



MACKS FOR EVERY

MACK B-40 SERIES

Available in four- and six-wheel models including six-wheel drive models, the B-40 series, slightly smaller than the B-60's, is especially valued for its bonus capacities, handling ease, and economical operation. B-40 dumpers, tractors, mixers, and flat-bed trucks use either Mack 150-horsepower Thermodyne diesel or Magnadyne gasoline engines. Like all Macks, the B-40 series is engineered and built with precision and thoroughness . . . your assurance of dependable and cost-saving operation.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 5 to 10 cubic yards; mixer, 5½ to 6 cubic yards (6-wheeler).

ENGINES: Gasoline: Mack Magnadyne, 150 h.p. Diesel: Mack Thermodyne, 150 h.p.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds, both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Four sizes. Mack, front-wheel drive (for 6x6 chassis).

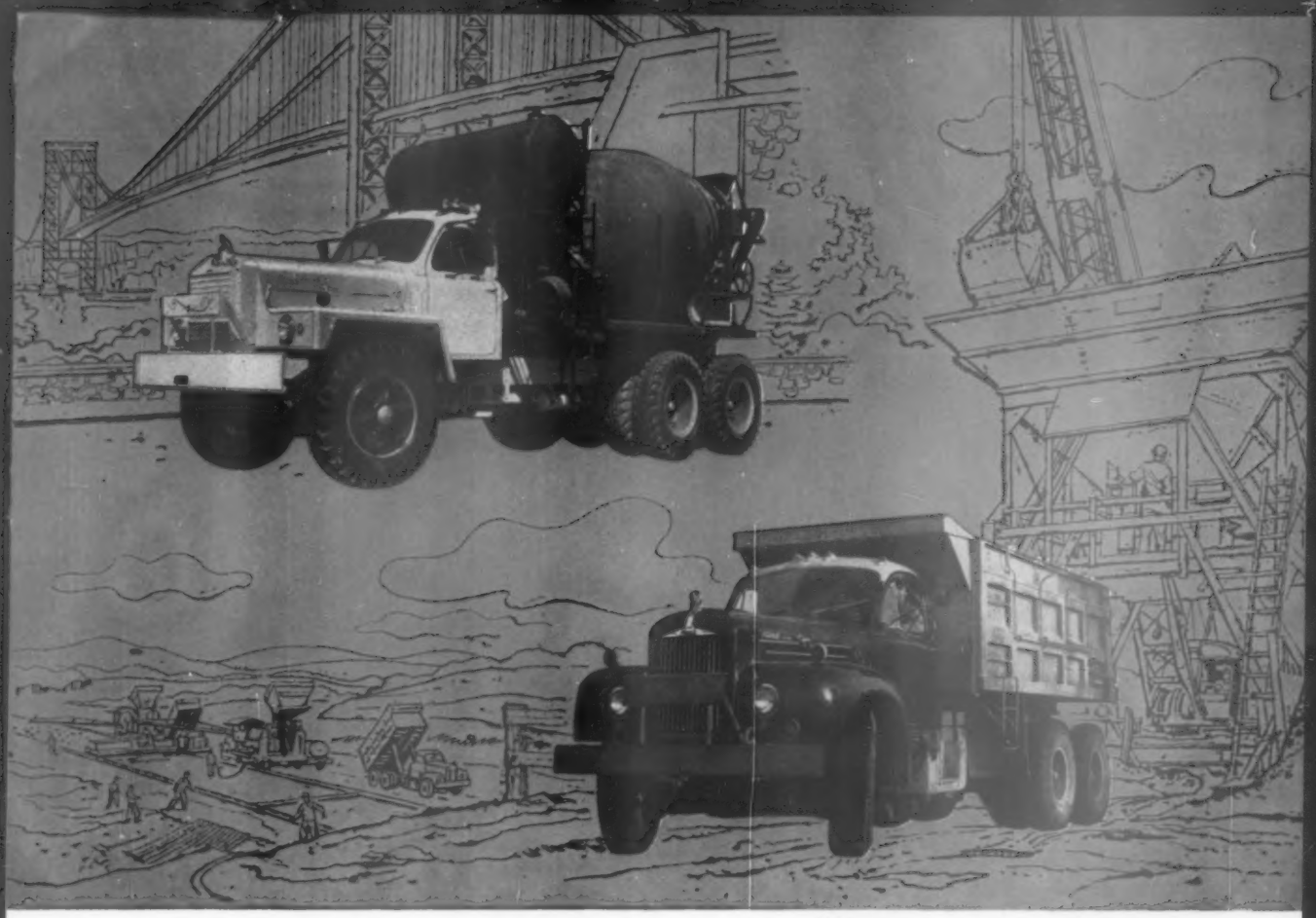
REAR AXLES: Four-wheelers: Mack Dual Reduction. Six-wheeler Bogie: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated, pressed; appropriate inside channel reinforcement (standard or optional extra).

TIRES: Available sizes and types: 10.00-20, 11.00-20, 11.00-22 (Four-wheeler). 8.25-20, 9.00-20, 10.00-20, 10.00-22, 11.00-20 (Six-wheeler). Availability contingent upon chassis.

STEERING: Hydraulic power steering (optional extra).

Illustrations are not necessarily representative of standard specifications.



CONSTRUCTION JOB

concrete, dry-mix, and asphalt hauling

ONLY MACK OFFERS ALL THESE PROFIT-POWER FEATURES

A truck or tractor for every construction job. Dumpers, concrete mixers, tractors, flat-bed trucks—there are dependable, economical Macks for every important construction task . . . right up to the biggest. Moreover, when you standardize on Macks, you gain the added savings of a completely integrated parts and upkeep operation.

Widest choice of engines. To meet your needs exactly, Mack offers a choice of proved, dependable engines in every power range: Mack Thermodyne® diesel or Mack gasoline engines at 150 h.p. . . . Mack Thermodyne diesel, Mack gasoline or Cummins diesel units in the 170-232 h.p. range . . . and Cummins diesels from 250 to 450 h.p.

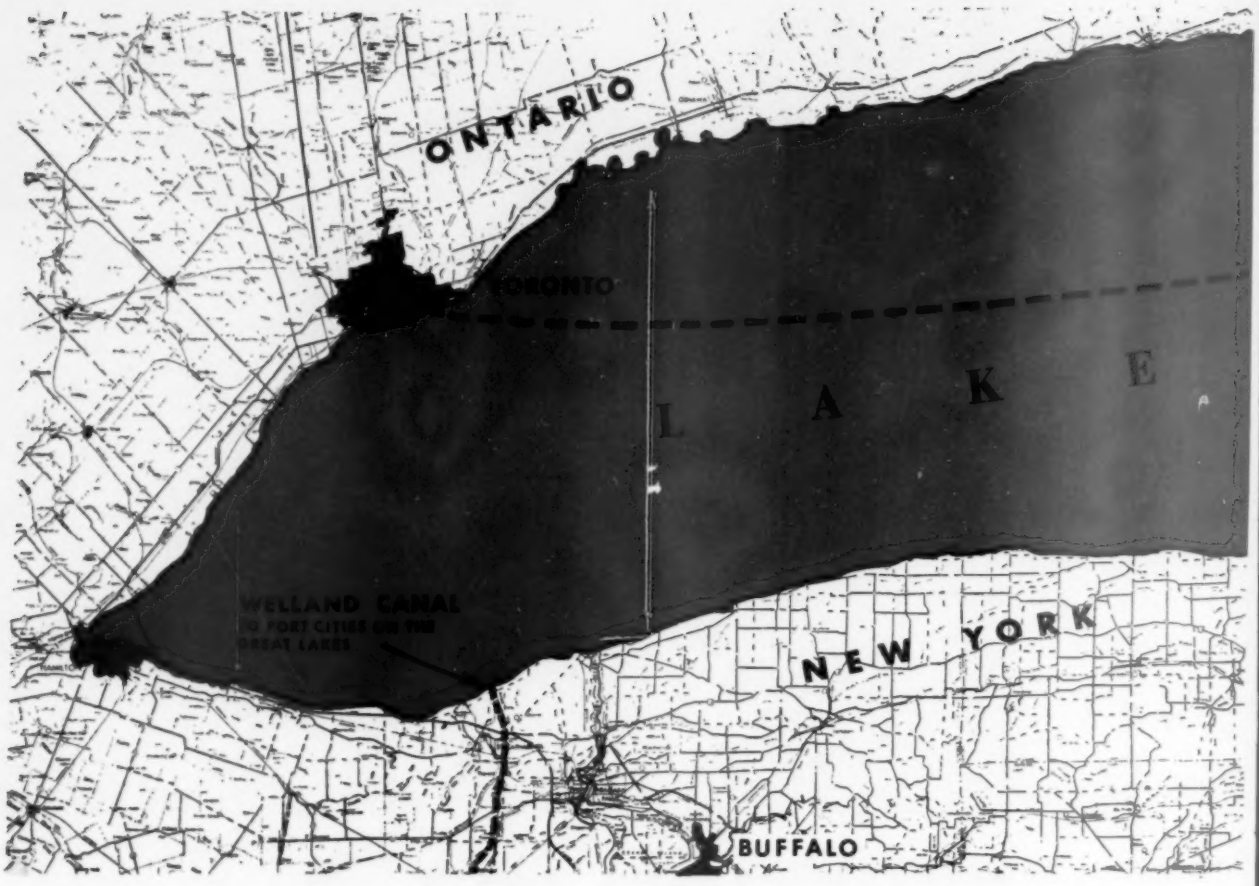
Unequaled performance and economy. Every Mack is fashioned from the finest, most durable materials . . . crafted to the highest standards of strength, stamina and precision in the industry. Mack controls this quality by making more of its own major components—engines, clutches, brakes, transmissions, bogies, cabs, etc.—than any other maker. Every Mack is engineered for fast, simple accessibility. And every Mack is "Built like a Mack"... made to outlast, outwork, and outearn anything else on demanding jobs.

Parts and service wherever you operate. Mack has spared no effort or investment to provide every Mack owner—everywhere—with the fullest parts-and-service coverage. There is a Mack branch or distributor close to your job who carries *nearly* any part you'll need on the job . . . and behind them are Mack parts depots that can ship out *any* replacement part at a moment's notice.

MACK
first name for
TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey
In Canada: Mack Trucks of Canada, Ltd.

Rock Products
OCTOBER, 1958



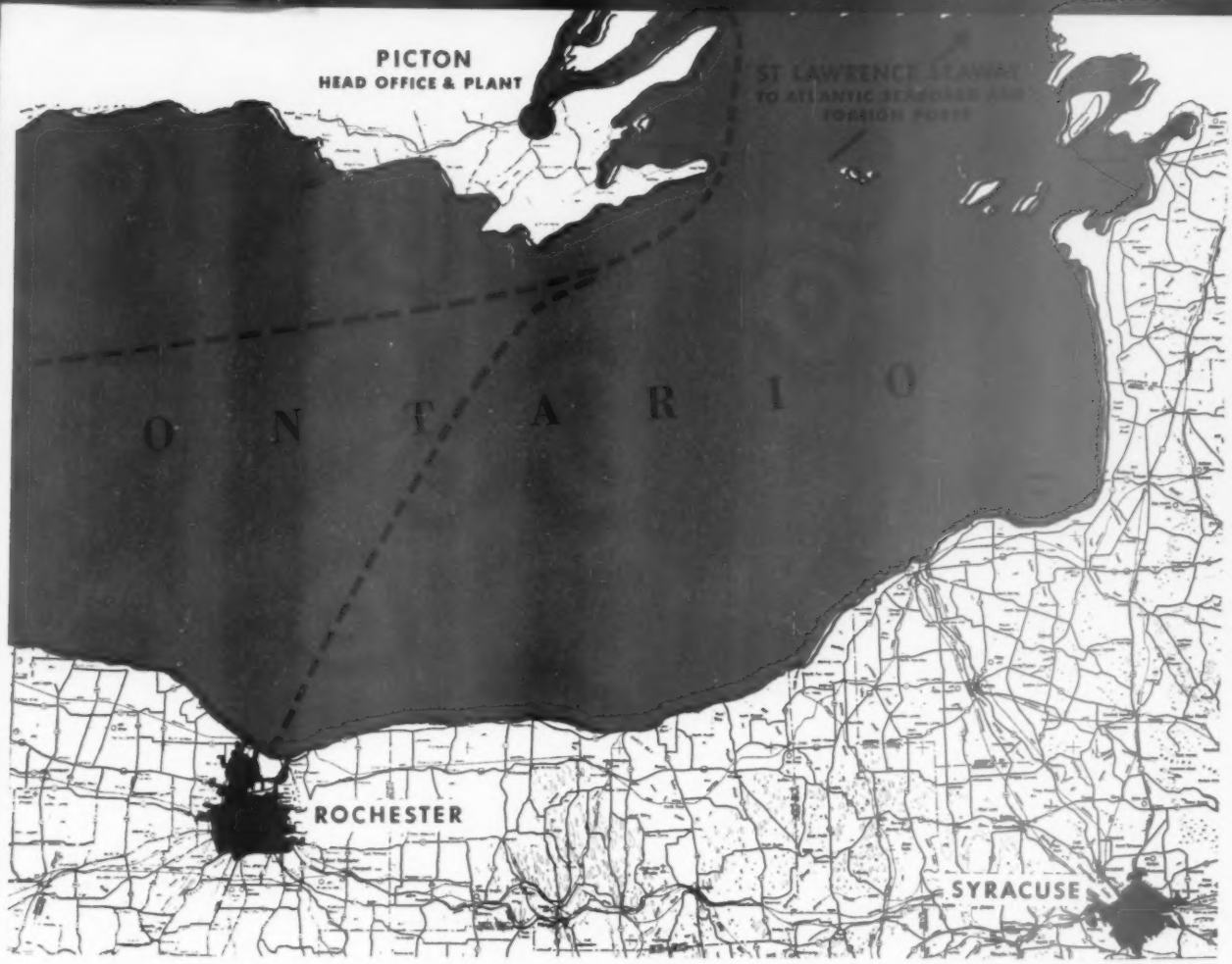
Lake Ontario ships cement and

Low-cost lake transportation, deep water harbor are

WHAT DOES IT TAKE to be a successful newcomer in the cement industry—to compete with big companies with national organizations and with small producers entrenched in regional markets? As the enterprising investors in Lake Ontario Portland Cement Co. Ltd. are finding out, it takes plenty to meet the tough competition in this risky industry. But they know that they do have many of the essential ingredients at their new $16 million plant at Picton, Ontario:

- Two "natural" markets readily accessible by cheap water transportation—booming Toronto, less than 150 miles away, and Rochester, gateway to the rich central New York State market, scarcely 70 miles across the lake.
- Talented, aggressive and experienced operating and sales personnel, top men who know how to make and sell low-cost, high-quality portland cement.
- Enthusiasm and drive—so necessary to get the 1.8 million-bbl. wet process cement plant into operation—generated by the dynamic personalities of H. J. McFarland, vice president and A. J. Anderson, general manager of the enterprise.

The new plant has two superlative natural assets to assure its success, plenty of limestone and a deep-water harbor. The whole eastern edge of Quince's Island is a massive ledge of hard, dense, blue high-calcium limestone. The new plant is right at the water's edge on a 65-ft. cliff that drops almost straight down to 30 ft. of water. By quarrying right down to the water line, the company can get enough stone to keep the cement plant running at capacity for more than 50 years. Un-



stone to these huge markets

prime assets of new cement plant

By ELWOOD MESCHTER

tapped reserves on the company's 700-acre property will provide the limestone to support increased production when the mill is enlarged and to make almost unlimited shipments of aggregates.

Deep water is a prime asset, for the largest lake boat afloat can come right to the edge of the plant and load to the Plimsoll mark with cement or aggregates. Once loaded at the protected harbor's 1,200-ft. dock, the boats make low-cost delivery to bulk cement storage silos or stone handling docks anywhere on the Great Lakes. When the St. Lawrence Seaway is opened to ocean-going ships, bulk cement can be sent to the Atlantic seaboard and to foreign ports.

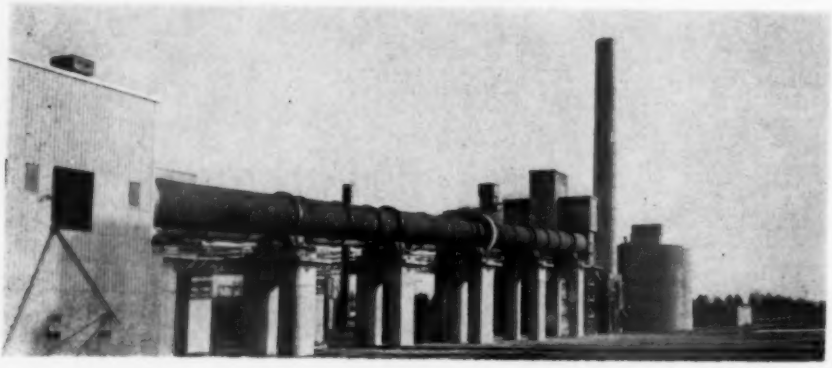
For the moment, the management of Lake Ontario will use the new plant's transportation advantages to consolidate its position in Toronto and Rochester. The output is expected to be split about equally between these two cities, and the company has bulk storage silos in each to make local delivery of cement.

The new plant relies on imported coal for fuel. The deep water dock can handle fully loaded boats bringing coal from American lake ports or gypsum rock from Nova Scotia. The need for fuel economy in the severe winters was a compelling reason for choosing the dry process of cement making. A winter's supply of coal and gypsum is brought in during the shipping season and stored on the bluff above the dock.

"Profit insurance" has been added to the new enterprise by its canny owners in setting up one of the biggest crushed stone plants in Canada as



A 5-cu. yd. electric shovel loads the dense, blue, high-calcium limestone into 22-ton trucks



These two kilns are 11 x 375 ft. long and have a capacity of 1.6 million bbl.

Hot clinker is handled to scalping screen with belt conveyor





Boats are loaded with cement at this point

Lake Ontario Cement

continued . . .

a part of the new cement plant. This 750-tph. crushing, screening and storage system can operate independently or simultaneously with the cement rock system. It makes five sizes of stone aggregates which can be reclaimed for boat shipment at better than 2,000 tph.

Fines from the stone plant are a "free" by-product and are sent to cement mill storage. Any minus 1-in. sizes in the rock plant storage can be reclaimed and sent to cement rock storage, while the whole inventory of sized rock represents an economical reserve which can be reprocessed for the cement mill if the quarry is shut down for any reason. Small sizes of rock are shipped to aggregates-starved markets all around the Great Lakes.

Stone in the quarry is remarkably consistent in analysis at all levels and is used for either cement rock or aggregates. The quarry will be worked in one 65-ft. face right down to the water, with a 5-cu. yd. electric shovel loading out to a group of four 22-ton rear dump trucks. A 48-in. gyratory primary crusher produces minus 6-in. stone at a rate of about 750 tph., and a stacker belt stores the crusher product in a single huge 10,000-ton surge pile.

Two parallel belt conveyor systems, one for cement rock, the other for the stone plant, draw from this surge pile. A pair of vibrating feeders pulls 250 tph. into the cement rock system; three feeders take out the 750 tph. maximum capacity of the aggregates system. Each system has its own screens, crushers, recycle belts and crossover. Sized stone can be reclaimed from storage and can be put into either system ahead of the screening and crushing tower. This gives great flexibility to the system, to make cement rock from aggregates or to re-size aggregates.

In the screening and crushing building, six vibrating screens and five crushers prepare rock for both the cement mill and the aggregates plant. The flow of cement rock is split between a pair of 5 x 12-ft. double-deck screens. The lower deck takes out the minus 1-in. rock, which is conveyed to cement mill storage, and the oversize from this deck is dropped to one of a pair of 36 x 48-in. double-rotor impact crushers and recycled to the top of the screen house.

The flow of aggregates is split between two 5 x 14-ft. double-deck primary screens in the top of the house, each with a grid top deck to scalp off plus 6-in. material and a bottom deck with $2\frac{3}{4}$-in. square openings in the screen cloth. The oversize is chuted to a 20-in. gyratory crusher and the oversize from the second deck can be sent either to storage or to a $49\frac{1}{2}$-in. gyratory, one of a pair of duplicate units available for fine crushing. Through-screen rock is dropped to one of two vibrating screens just below for fine sizing. These are 5 x 12-ft. double-deck units, with $1\frac{1}{4}$-in. square openings in the top deck and $\frac{7}{16}$-in. slotted



Retractable belt conveyor system loads boats with stone



About 80,000 tons of crushed and sized aggregates can be stored under these towers

Lake Ontario Cement

continued . . .

openings in the lower deck. The discharge chutes are arranged so that oversize from the top deck is sent to one of a pair of gyratory crushers and oversize from the lower deck is sent to the other crusher. Through-screen material is put on the cement mill conveyor or dropped to the conveyor which goes to aggregates storage. With the four screens and three gyratory crushers in the aggregates preparation system, an almost infinite number of sizes in almost any volume can be prepared.

Four huge screen towers dominate the rock storage area. Each tower houses two parallel 5 x 14-ft. single-deck screens to scalp out the stone to be stored beneath the tower. Through-screen stone drops to an inclined belt conveyor to be taken 100 ft. to the next tower, and the process is repeated in each of the four towers. The fines are stored in a fifth pile or remain on the belt conveyor which discharges to the cement mill conveyor.

The four spider-like supports for each tower straddle an area with a capacity for storing about 80,000 tons of aggregates in a pile about 50 ft. deep, 100 ft. wide and about 150 ft. long. Concrete retaining walls between the piles keep the sizes segregated. A concrete reclaim tunnel has been poured in the bottom of a trench cut in the solid rock between the towers, and a 500-ft. belt conveyor system in the tunnel reclaims stone for shipment or to be recycled back to the crushing plant. The tunnel belt conveyor discharges either to a 48-in. retractable boat loading belt conveyor or to an inclined belt conveyor system for return of stone to the crushing circuits.

Rock for the cement plant is brought by a 650-ft. conveyor system from the screen plant to the cement mill storage area. Here a belt conveyor distributes the minus ¾-in. rock in a 100-ft. section of the covered storage building. A 13-ton, 100-ft.-span overhead traveling crane reclaims limestone to the raw mill storage bins.

The storage area has a large section for handling both raw and dried clay. The clay is taken from pits on the company's property and must be dried before milling with limestone. Truckloads of clay are dumped within reach of the overhead crane which puts clay into an apron feeder ahead of a "mud-hog" clay crusher. Hogged clay is dried in a 10 x 50 ft. rotary dryer to remove about 10 percent of the moisture before it is returned to storage. Small amounts of silica sand and ferric oxide are kept in storage to supplement the iron and silica in the clay and limestone as it may be needed.

The mill department at Lake Ontario has four two-compartment, 11 x 20-ft. ball mills—two finish mills, one raw mill and one for either raw grinding or finish grinding. All mills are fed by variable-speed weighing belt feeders which discharge to a gathering belt conveyor.

Please turn to page 142

Jet flame attacks, melts toughest rock

THE ROCKET JET PRINCIPLE that powers jet aircraft and missile weapons was used to sink blast holes on the gigantic St. Lawrence Seaway project.

United Waterways Constructors, Ltd., a group of Canadian contractors, used a new jet-flame piercing process on its segment of the Seaway. This $14 million contract called for the removal of 2¼ million tons of rock on the Upper Beauharnois Lock job, near Melocheville, Que.

Supersonic jets of flame, fed by 10,000 cu. ft. of oxygen and 40 gal. of fuel oil per hour, are the key to the new process. Traveling five times faster than the speed of sound and reaching temperatures of 4,000 deg. F., the flame spits out of a rocket-type burner and disintegrates or spalls the rock in its path. This is a continuous operation—disintegrated rock particles are thrown up out of the hole by the combined force of burning gases and steam, so that a fresh surface is continually exposed to the jet flame.

The only limitation to penetration depth is the length of the hoses (carrying fuel, oxygen and water) that are lowered into the hole. Deepest penetration to date is 160 ft. At its highest velocity, the flame has a mechanical energy equivalent of about 500 hp.—contained in a flame not more than 18 in. long and 2 in. wide.

Low-viscosity fuel oil or a liquid hydrocarbon fuel such as kerosene is combined with high-purity oxygen to produce the flame. A blowpipe suspended from a crawler carrier controls flame combustion and action. This rig is actually a modified churn-drill rig.

The developers of the process have found that it works fastest on that class of rocks—especially those containing silica—which normal drilling methods find toughest. These rocks include granite, syenite, quartzite, sandstone and magnetic taconite. Potsdam sandstone, the rock being pierced on the St. Lawrence Seaway, is a highly abrasive material that would normally cause excessive bit wear. In the past it has taken as long as a week to drill a 100-ft. hole in this very hard rock. With the jet-flame a 100-ft. hole can be sunk in a single shift.



The jet piercing rig is fed 10,000 cu. ft. of oxygen and 40 gal. of fuel oil per hour. Oxygen is usually supplied from a cylinder trailer that carries enough oxygen for 8 to 10 hours' operation

Our country's largest reserve of domestic iron ore consists of iron-bearing ore formations called taconite. Known as "the meanest rock on earth," taconite has a hardness capable of scratching glass. Taconite is found principally in the Mesabi Range of Northern Minnesota and throughout Northern Michigan. At one time it was considered impossible to mine.

Blasting was the only possible method, but blast holes could not be drilled economically. In 15 min., the strongest steel drill would get only 3 in. down into the tough taconite before being ruined, and blasters needed thousands of holes at least 18 ft. deep to blast out the stubborn, iron-rich taconite.

The jet process opened up the Mesabi Range and made it possible to produce blast holes 40 ft. deep and 7 in. wide at speeds of 12-40 ft. per hour. It is now estimated that in less than 20 years over one-third of our iron ore requirements will be supplied from taconite.

Please turn to page 148



The amazing

By JOSEPH N. BELL

THE MAJOR PROBLEMS facing the rock industries today are community and governmental relations, industrialist Henry J. Kaiser told ROCK PRODUCTS in a recent exclusive interview. Kaiser, who began building his huge industrial empire with the sand and gravel business he still operates on the west coast, carries on a constant, large-scale program of community information in all his plant communities, all the time.

"We are fulfilling an essential, but sometimes unrealized need," says Henry Kaiser. "It's a truism. You can't build a home, highway or a school unless you have the industry's products. The fact you have to dig holes in the ground to produce them is a reality and a problem which must be faced by the community, elected representatives of the people and, of course, by the sand and gravel industry. Having the shovels and trucks considerably removed from populated areas is no answer. Because the cost of materials has to rise in direct proportion to how far they have to be shipped, it doesn't take too many miles to make the price prohibitive.

"Kaiser Sand and Gravel, like other producers, is trying to find the answer," he continued. "We have spent a great deal of money, time and thought investigating ways to convert mined-out areas to agriculture, recreation, water storage or control or some other productive end. The problem we're trying to lick now is how do you do it and still turn out a product at a price that is fair to both public and producer."

But while seeking these answers, Mr. Kaiser emphasized the importance of education. "We're telling community residents who benefit from our production, but who see the ground level dropping, why sand and gravel production is important to them and what we're doing to try to solve the mutual pit problem," he said. "Our community information program includes newspaper publicity, advertising, speeches to interested civic groups and other means to present the facts. For example, when our largest sand and gravel plant reached its 25th year of production, more than 1,000 civic leaders, local residents and employes gathered on its green area for a 'Family Day'. We told them what sand and gravel meant to them and what our future expansion and redevelopment plans were. When they left our grounds at sunset, they knew something about our business and problems, and we had 1,000 supporters."

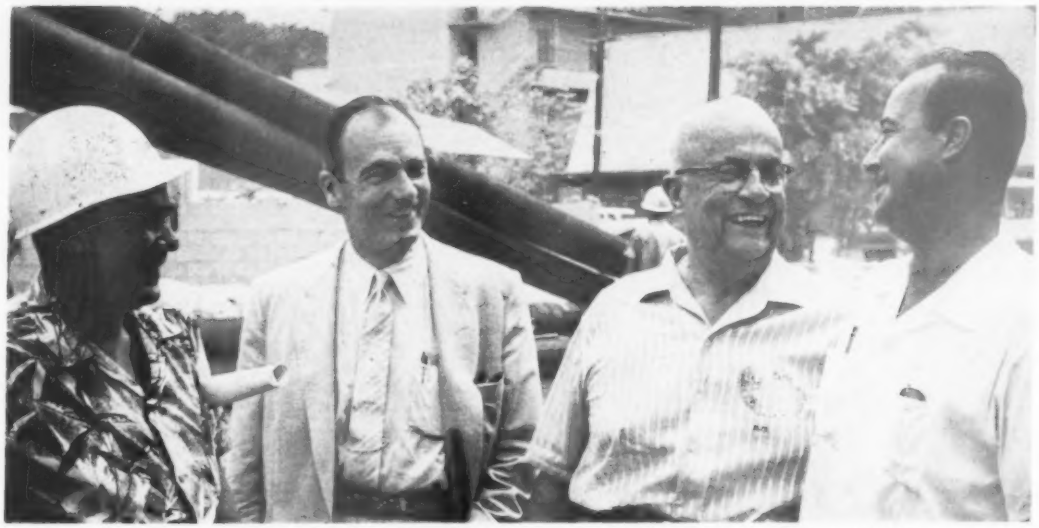
The cold statistics on the Kaiser industrial empire are almost overwhelming. Today Kaiser affiliated companies operate 81 factories and facilities turning out 300 products basic to the growing economy of the free world. The combined Kaiser companies sell more than one billion dollars' worth of goods and services a year; their assets exceed one billion dollars, and they have a total of 79,000 stockholders.

Henry Kaiser is a remarkable figure among the industrial greats of America; in the rock products industries—his first love—he's a colossus. Although he is now 76 years old and spends much of his time at his hotel project in the Hawaiian Islands, he still takes a lively and active interest in the operation of his rock industries plants.

That interest started in 1912, when he became manager of paving contracts for a Spokane, Washington, construction company. Two years later, he had his own highway construction company. In 1923, he won a grading and paving contract for a five mile stretch of road near Livermore, California. With characteristic Kaiser impetuosity, he decided to provide his own sand and gravel; the result was a plant at Livermore, followed seven years later by the Radum plant at Pleasanton—which today forms the backbone of the Kaiser Sand and Gravel Division, the first of the multiple Kaiser operations. Thus has the Kaiser industrial empire grown from a modest gravel plant in northern California.

Today, Kaiser's Sand and Gravel Division, with 10 plants, employs about 350 men and women and turns out 10 different products. It is one of the San Francisco Bay Area's leading producers of aggregates and related materials, with an annual payroll of more than $2,000,000 and sales of about

Henry J—rock products individualist



While overseeing construction at his Hawaiian hotel, Mr. Kaiser chats with the crew

$6½ million. The Radum plant has consistently been ranked among the top dozen gravel-producing facilities in the nation and was the foundation for such memorable construction adventures as the Hoover, Bonneville, Grand Coulee and Shasta dams.

The Kaiser "industrial era" really began with the founding of the Permanente Cement Company in 1939. Kaiser had nurtured the desire to build a super-cement plant for many years when competitive bids were sought for the materials in Shasta Dam. Kaiser gambled that a successful bid for the cement business for Shasta would provide enough impetus to put him in the cement business and keep him there. The gamble was well taken. He was awarded the cement contract for Shasta with no production facilities to back up his bid. Seven months later, the first bag of Permanente Cement was produced and Henry Kaiser was in the cement business in a very large way—to stay.

Since that day in 1940, Permanente has grown remarkably. Today the original Permanente plant is one of the two largest in the world with a capacity of more than 8½ million bbls. of cement annually. The Permanente Company last year completed a $45 million expansion program, adding a new 2½ million bbl. plant in southern California and increasing its cement production capacity by 57 percent and gypsum capacity by 87 percent. In July, Permanente purchased the Olympic Portland Cement Co. and its 1,750,000 bbl. plant at Bellingham, Wash., thereby acquiring a cement manufacturing facility in the Pacific Northwest, where the company has been distributing for many years. Permanente now has about one-fifth of the cement and insulating product capacity and almost one-third of the gypsum product manufacturing capacity on the Pacific Coast.

With such a rich background in the rock industries, Henry Kaiser is highly sensitive to their problems. Here's what he had to say about some of the other major difficulties faced today by sand and gravel producers and cement manufacturers in his interview with ROCK PRODUCTS:

Q. Do you feel the federal highway program is dragging its feet?

A. Not particularly. The common belief that the federal highway program is dragging its feet is a result of the undue publicity given to the program when the legislation was first passed. A great deal of attention was given to the vast amount of equipment and material that would be needed, and very little attention was given to the cost and time required for engineering, acquiring right-of-way etc. Actual use of materials probably



Radum sand and gravel plant (in 1930) is the backbone of an empire . . .

The amazing Henry J—

continued . . .

will pick up rather markedly in the next two years. We are not depending on the program to absorb new cement capacity. As a matter of fact, we may have to increase our capacity if there is any huge demand from the road-building program.

Q. Do you feel that concrete is getting as large a share of our major highways as it could and should?

A. No. Both individuals and governmental agencies are too prone to look at first cost and not at long life and low-maintenance costs. Obviously the industry needs to do a better selling job.

Q. Do you feel that the cement industry has over-expanded?

A. Not overall. However, most individual cement plants—unlike Permanente, which has a unique marketing situation—have a delivery radius of around 250 miles. Therefore, expansion must actually be related to geographical areas rather than to the country as a whole. Some areas have expanded beyond current demands.

But it's impossible to expand economically in small increments. It was necessary, therefore, for various companies to expand not just for business this year, but for next year and the year after. Nevertheless, we feel that the industry has not over-expanded.

Q. Do you expect the markets for concrete to continue to grow?

A. Yes. We expect the continuation of the rapid growth in the demand for cement in the far West. Increasing population will mean increased building activity in all fields.

Q. What new developments in concrete do you consider the most important?

A. I would suggest four things:

—Development of special cements;

—Technological advances, such as prestressing and tilt-up, in the construction industry;

—More extensive use of design in concrete construction to add beauty to the other outstanding qualities of the material;

—Development of the ready-mix industry, which has been a big boon to construction by assuring builders of properly prepared concrete, transported to the job site.

At 76, Henry Kaiser simply brushes off the idea of age as a matter of mental outlook and therefore no problem to him. "I know fellows who are old at 40," he says, "old in outlook, aging in inner drives, actually starting to die off long before their times. But, on the other hand, there are more and more persons finding that life can begin at 40 or 50,



. . . coordinated from this new home office building now under construction in California

60 or 70—in fact that every day can bring a fresh beginning as long as they keep the zest for new discoveries, new ideas, new work, and renewed quests for achievement and happiness."

Kaiser's answer to age has simply been to keep young in thinking, in imagination, and in spirit. Nowhere was this better demonstrated than in his most recent adventure, the building of his resort on the Hawaiian Island of Oahu.

Several years ago, he wanted to go to Hawaii for a much-needed rest. He couldn't get a room reservation—anywhere. So Henry decided to make sure that neither he, nor thousands of other poor souls like him, would want for room reservations in Oahu. Although all this happened in the midst of his only real failure—that of the Kaiser-Frazer automobiles—he laid out plans for a 2,000 room hotel and resort area in Hawaii and started work on it immediately. While he was at it, he also purchased a $187,000 home on the beach where he and Mrs. Kaiser now live.

Just contemplating his normal working day at 76 is enough to wear out many a younger man. He rises at 5:30, wanders through his garden overlooking the Pacific until breakfast at 6:15. At 6:30 he leaves home and inspects his current construction projects on the way to his office. At 7:30 he has coffee in the dining room of the Hawaiian Village hotel and confers with some of his construction heads. He reports to his office by 8 a.m. and from then until lunch at 12:30 or 1 there is a steady stream of conferences with executives flown over from the mainland to discuss problems relating to his 61 industrial operations in the United States. In the midst of all this, he confers daily at 10 a.m. with the entertainment director of the hotel on plans for the evening.

He always lunches with subordinates who need to see him on business, then makes another round of construction projects before heading back to his office for the afternoon. There he takes care of his voluminous correspondence, then returns to conference sessions until his office day ends at 7 p.m. He usually has dinner at home at 7:30, makes a few afterthought phone calls to the mainland, and goes to bed about 10:30 with a notebook handy at his bedside to jot down any ideas that occur to him while he's supposed to be resting.

Into this fantastically crowded schedule have crept a number of eccentricities which a man of Mr. Kaiser's stature can indulge. For example, he always flies at night (and he travels thousands of air miles a year) so it won't encroach on daylight working hours. He frequently phones the mainland at 5:30 a.m., dragging some subordinate in Oakland out of bed at 7:30 because of the two hour time differential. And he has an affinity for French poodles and motor boat racing.



Edgar F. Kaiser



Henry J. Kaiser, Jr.



Plant tours, like this one

The amazing Henry J—

continued . . .

Henry Kaiser's personal philosophy of life encompasses four implicit convictions:

First, know yourself and decide what you want most of all to make out of your life. "The mistake," says Mr. Kaiser, "is to put your sights too low, not to raise them too high. The definite, faraway goal will supercharge your whole body and spirit; it will awaken your mind and creative imagination, and put meaning into otherwise lowly, step-by-step tasks you must go through in order to attain the final success."

Second, use the great powers that you can tap through faith in God and the hidden energies of your soul and subconscious mind. On this point, he adds: "It is the tragedy of this age that whole races of man seem to have sunk into a faithless surrender to fatalism and a confused despair. They feel that they have lost control over their own destiny. Yet, again and again I have seen the tremendous power of faith. For example, only a faith that it could be done led to the construction of Bonneville Dam in Oregon."

Third, love people and serve them. "If your aim is bold and high," says Henry Kaiser, "you may search for new products and new services that will fill the needs of others. Whenever I see an unfilled human need, I have an irresistible urge to do something about filling it. And I try hard to keep believing in the good in all my fellow men, instead of in the bad."

And finally, WORK. No associate of Henry Kaiser will ever deny that he lives by the spirit as well as the letter of this fourth admonition. Mr. Kaiser says: "Live daringly, boldly, fearlessly. Taste the relish to be found in competition—in having to put forth the best within you to match the deeds of risk-taking, hard-working competitors. Take the well-considered risk instead of the sure thing that fails to call forth the most you have to offer."

Henry Kaiser makes every effort to carry this philosophy over into all of his far flung business operations. He doesn't consider the expense involved in being a good neighbor as a debatable item at all, but rather as a moral obligation which business must assume.

"Zoning," he says, "is a problem that all industrial firms must face when they are located in other than industrial areas. The solution is education. If you are honestly trying to alleviate whatever problems might exist, be it dust, noise, smell or the necessity of running trucks through residential areas, you must keep those affected informed of what you have been and are doing to make yourself a better neighbor. People are prone to be sympathetic when they understand.

"At Permanente Cement," he continued, "we have always felt it economical as well as neighborly to collect as much dust as possible from its operations. We don't consider the expense top-heavy, and we've been able to keep up with the 'art' of dust collection by continually improving the systems at all our plants."

Kaiser's genius has taken many directions, but one of the fields in which he is probably best known is that of human relations. During World War II, he was asked by the Navy to take over management of a Brewster Aeronautical plant, where la-



at Permanente Cement Co.'s Cushenbury plant, create good public relations

bor relations were incredibly bad and the production of vitally needed Corsair fighter planes had fallen off practically to zero. He met with the labor leader who was leading the trouble makers and found he believed that all management was dishonest, unreliable and untruthful. Slowly, ploddingly, patiently he sought a common ground on which he could meet with the union to achieve a needed end. Inevitably, he found it and the workers pitched in shoulder-to-shoulder with management to clean up the Brewster mess. Man-hours per plane were slashed to one-third; the work force was cut in half; and the production of planes was multiplied nearly 30 times.

On another occasion, he was notified that one of his plants had been closed by a secondary boycott and picket line called by an outside union with which the company had no dealings. He went immediately to see the head of the outside union, who growled: "I suppose you came here to tell me I'm a lawless guy?"

"No," said Kaiser, "I don't have to tell you that because you already know it. I came here simply to understand you and your reasoning, and to find out if I could be helpful."

Recalling the incident, Kaiser says: "The issue was settled peacefully and quickly. But my thrill came in once more discovering that the inherent good in man can be brought out even from one who is ruthless in a battle. Why do we so often let our attitudes bring out the worst in each other, instead of the best?"

The written policy of the Kaiser companies on collective bargaining declares the companies' belief in the fundamental democratic right of the employes, subject only to applicable law, to decide for themselves whether they wish to be represented by a labor organization for the purpose of collective bargaining.

Mr. Kaiser puts it a little more poetically. He says: "The employe's joy in life is enriched when he can be loyal both to his union and to his company. The individual doesn't have to be torn between choosing one side or the other, when the relations and conduct of both company and union are right. He can be proud of both—proud of a free democratic organization that protects and advances his interests; proud of a company that is fair and square."

Kaiser's cure for the present recession is characteristic—more vigorous salesmanship. "This is a year for selling, for real salesmanship," he says.

Although tanned, cherubic-looking Henry Kaiser still keeps a personal hand in most of his far-flung operations, he has surrounded himself with capable and talented subordinates. His two sons, Edgar and Henry, Jr., help run the Kaiser industrial empire from the headquarters office of Kaiser Industries in Oakland, California. They, in turn, are backstopped by a huge family of almost autonomous corporation executives who serve as operating heads of the various Kaiser corporate entities.

It is said that no permanent structure can be built on sand, but Henry Kaiser has given lie to this truism. He's built a solid, substantial industrial empire on the sands of his Radum gravel bed —and it seems destined to stand for a long time to come. END



Revolving scrubber sits atop screens in sand and gravel plant

Pick your own

be sure you consider

By WILLIAM A. RUNDQUIST

In part I, a sampling of increasingly stringent specifications showed why aggregates producers should reappraise their present methods of washing and sizing. Because the technique of washing coarse aggregates differs from that of washing fines, the two have to be considered separately. This section deals with washing of coarse material.

BROADLY SPEAKING, aggregates are washed to make them meet specifications. But water actually does more than merely wash the material. Among the uses of water are these: elimination of clay and silt; removal of shale, coal, soft stone, roots, twigs and other trash; sizing, and classifying or separating. And, of course, dewatering must also be included.

Availability of the right quantity of water at the right cost is an important factor in selecting the site of a washing plant. Naturally, if water from the same source as that used for washing is also to be used in mixing concrete, its quality must conform to specifications, or else it must be possible to treat the water economically to make it conform.

Furthermore, before a site is chosen, the materials to be processed should be tested to make sure that they can be made to meet specifications. Too much time and equipment may be required to make some materials come up to standard. The project materials engineer can be of great help in determining the economic suitability of the material. He generally has to approve the source before production begins, anyway. As an additional help, most manufacturers of washing equipment will test samples of source material to determine whether their equipment can do the job right.

From the standpoint of washing, aggregates fall into two groups. Coarse aggregate, generally material above ¼ in., is usually washed to remove foreign, objectionable substances, including fine particles. Fine aggregate from ¼ in. down to dust is most often washed to remove dirt and silt, while sand down to 100 mesh as in concrete sand, or even 200 mesh, as in "black top" sand is retained.

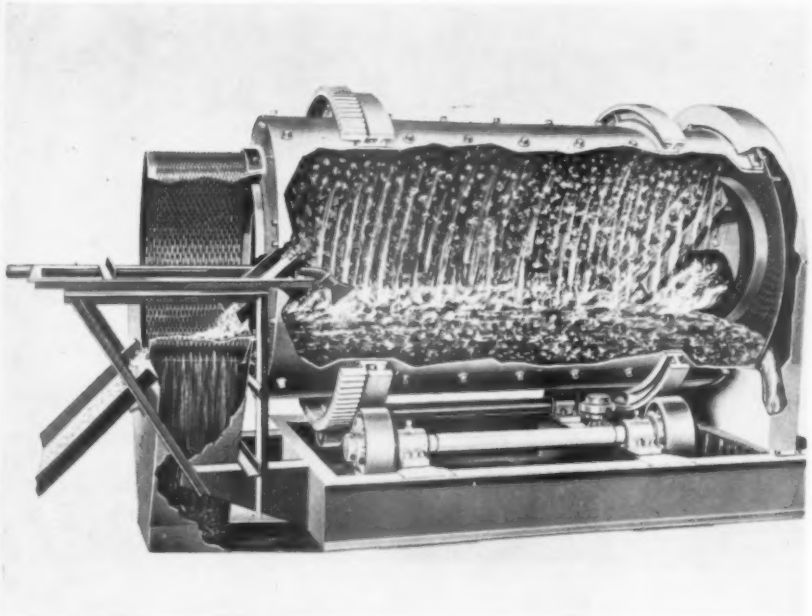
Coarse aggregates can be screened into various size ranges. With fine materials, however, screening to smaller than No. 8 mesh becomes impractical. Water is the best means of classifying the minus No. 8 material.

There are several ways to approach every step in the processing of aggregates. This is true of the problem of washing coarse aggregates. The main disagreement is whether the material should be sized first and then scrubbed, or vice versa. Actually there is no hard and fast rule. In some cases it may be advantageous to precrush all the material to size prior to scrubbing; in others, it may be desirable to precrush to a size where a simple reduction crusher can handle the oversize from the coarsest washing screen. The method used depends on the nature of the source material, the amount and kind of deleterious matter present and the efficiency and capacity of the cleaning machinery.

Scrubbing is required when silt and clay adhering to the surface of the material cannot be removed by a rinsing and dewatering process. The amount of scrubbing needed depends on how dirty the material is and on the way this dirt reacts to water. In clayey materials, for instance, the clay may be readily softened, disintegrated and carried away by the water. On the other hand, it may be a kind that forms balls. Since these clay balls cannot be screened out, they have to be broken by some kind of abrading action.

gravel washing methods but . . .

source material, deleterious matter and machinery capacity



Revolving scrubber cleans gravel with water spray and tossing action



Paddles clearly show on 25 ft. log washer

The most common kinds of equipment for removing clay and soft materials are the revolving scrubber, which precedes the screening process, and the log washer, which follows screening.

Some revolving scrubbers are quite simple, consisting essentially of a cylindrical shell with lifter flights. As the shell rotates about its longitudinal axis, the material is tumbled against a flow of water. The water may be introduced with the feed or brought in by pipes. Some operators add rinse water through sprays; others rely on a rinsing over the screens to clean out the loosened particles. Best practice calls for a spray rinse at both points, in the scrubber and over the screen.

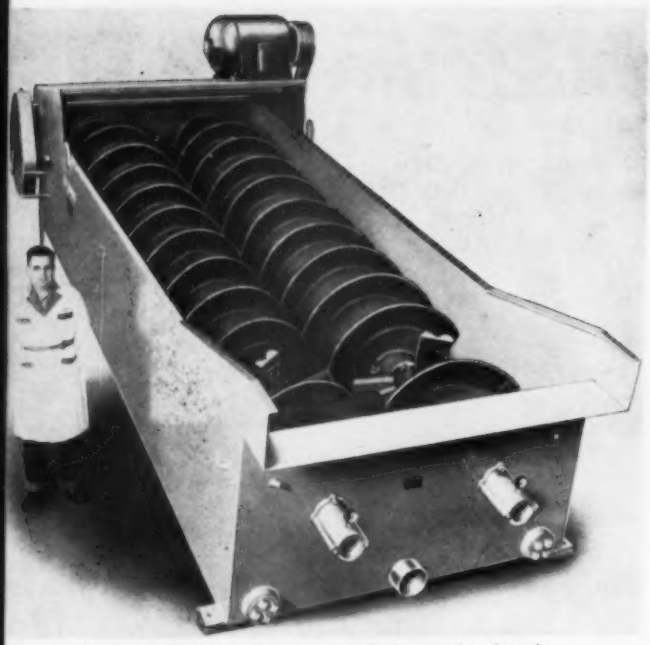
In recent years, revolving scrubber diameters have been increased, flights have been made deeper and more numerous and speed of rotation has been increased. All these moves are intended to improve scrubbing efficiency. For sand and gravel, a good scrubber will have a built-in cylindrical screen to pass sand and fines to the outer drum. This leaves the lifting flights free to churn the gravel more efficiently.

For handling crushed rock, the screen is left out, but the number of lifting flights is increased, and they are staggered to improve the grinding action of rock against rock to break off loose fragments. The rate of material flow through some of these scrubbers is controlled by baffle rings that divide the scrubbing chamber into compartments.

In the conical type of revolving scrubber, stone or gravel enters the feed end along with the wash water. Material is tumbled and cascaded about, being thrown back by the blades in the conical end. Thus, clay balls and soft stone are more readily disintegrated. Dirty water carrying silt, disintegrated clay balls and sand is discharged through the first section of the revolving screen.

Another one of the more successful types of revolving scrubbers is the blade mill, sometimes called the paddle mill. The inside wall is equipped with adjustable paddle blades that cut through the material as it is tumbled. Material up to 10 in. can be handled in this type of mill.

The log washer operates on a somewhat differ-



Coarse material washer removes shale, wood and trash

Aggregates washing

continued . . .

ent principle. It is particularly effective where clays are plastic, cling tightly to the surface of the rock or stone and tend to form into balls when rolled and tumbled.

The log washer's name is derived from an earlier day, when two logs with metal paddles driven into them were rotated against each other in a trough, moving wetted material from one end to the other. Today's "logs" are steel, to which are attached various forms of abrasion-resisting steel paddles. The log washer has a cutting and abrading action, and uses a minimum of water—just enough to "grease" the material as it moves through the machine. The revolving scrubber requires considerably more water per ton per hour of material to do an adequate cleaning job.

The paddles in the log washer slowly move the material towards the discharge opening at the upper end of the tub, while foreign material is discharged with the overflow water through a gate at the lower (feed) end. Soft, soluble clay requires more water than the tough, plastic, insoluble kind. Depth of water is controlled by the height of the discharge gate.

To do an effective scrubbing job on dirty or clayey coarse materials, it is essential that sand and fines be removed. With a log washer, this is done first by screening, preferably wet. With a revolving scrubber, fines may be removed as described above, by a cylindrical screen housed inside the scrubber. Or fines may be taken out by causing the wash water and the material to flow in opposite directions. This way, the fines are washed out through a perforated plate at the feed end of the drum.

Generally, a revolving scrubber is installed so that it slopes downward from the feed end. The log washer is installed so that it slopes upward from the feed end. Normal slope is about 8 deg., with a 5-deg. minimum and a 10-deg. maximum.

Whether to use a revolving scrubber or a log washer is a controversial question. Both should be followed by rinsing at some stage of processing to make the coarse material really clean. For ordinary clays that tend to dissolve in water, or for breaking up loosely formed conglomerates and soft stone, the scrubber and the log washer may be considered equally effective. In the more tightly formed conglomerates and in plastic clay tending to ball, the nod has to go to the log washer, mainly because of its more positive abrading and cutting action.

In many cases, neither the revolving scrubber nor the log washer is required to clean the coarse aggregate. Then, deleterious matter—including shale, wood, coal and trash—can be removed by a coarse material screw. Both single and double-screw washer-dewaterers are available; the choice depends largely on the capacity needed. Coarse material screws are also available with paddles at the lower end to aid further in abrading the dirtier materials.

The coarse material washer is a long, vertical-sided tub in which a screw turns. Material is fed in at the lower end, and the screw gradually works it up through the water to the discharge end. Dewatering takes place in a length of tub above the water.

Coarse washers are equipped with an adjustable end plate at the lower end of the tub. For processing the larger sizes of aggregates, this plate should be set at the lowest position or removed. The smaller sizes of coarse material can be washed by raising the end plate and feeding the material farther up the tub and by reducing the volume of wash water. When there is a wide range between the top and bottom sizes of coarse material, it is necessary to use more than one coarse screw and to make a size split in the feed to each. Maximum size feed to a coarse screw washer is about 2½ inches. So a good split might be 2½-1¼ in., 1¼-¾ in., and ¾-⅜ in., depending on the sizes of aggregates required.

The screw-type coarse material washer can be equipped with a tub end designed to remove shale and similar material. The shale remover seals off



New troughed washing screen uses high pressure spray and vibrating screen to remove clay

the lower end of the tub. Overflow water is forced into a rising column of considerable velocity through an opening formed by a pair of hinged baffle plates. Material is fed onto an incline so that it is met by the column of rising water. The shale floats out, while the good material enters the tub. When shale is being removed, it is important that the feed material be graded and that a separate washer be used for each size. This is because the small differences in specific gravity between good stone and shale require exacting adjustment of the shale remover baffle plates.

The coarse material washer of the screw type is also available with a tub end designed to remove trash more easily floated than shale. This tub end consists simply of an inclined plate, up which the trash is rolled by the overflow water.

To keep the shale, trash and other larger-sized foreign matter out of the waste flume, a piece of woven wire cloth can be fashioned to form a strainer. This is emptied as necessary.

Troughed washing screen. As mentioned before, screening is called for before material enters a log washer. It is also a prerequisite to the use of the coarse material screw. The troughed washing screen is a recent development, gaining in popularity where stubborn clays pose an extra problem.

The troughed screen consists of steps of screening area, between which are pockets or troughs. The material falls into these troughs as it progresses from feed to discharge end of the screen. A high pressure spray is directed into the troughs. The combination of the "circle throw" of the vibrating screen and the sprayed water is effective in loosening the clay or other adhering deleterious matter and assisting in the screening job. As a matter of fact, the troughed washing screen is frequently so effective in cleaning material that

Please turn to page 162

TABLE I
Typical Specifications—REVOLVING SCRUBBERS

Diam. of scrubber, in.	60	72	84	96
Type of scrubber	Sand or Gravel	Sand or Gravel	Sand or Gravel	Sand or Gravel
Length of scrubber cylinder, feet	9	10½	12	14
Horsepower required, high torque, electric motor	40	60	100	125
Capacity per hour, tons	35-70	60-120	95-180	120-240
Max. size of feed advisable, inches	3	4½	6	8
Water required, gpm.	200-300	350-550	550-850	700-1100

TABLE II
Typical Specifications—PADDLE TYPE LOG WASHERS

Log diameter, inches	36	36	48
Tub width	7'	7'	9'-4"
Tub length, feet	20	30	30
Max. capacity, tons per hour (Depends on material size and the amount of foreign material to remove)	85	85	150
Maximum material size, in.	4	4	8
Horsepower req. (electric) at normal speed	60	100	150
Water required (gpm. at 25 psi.)	50-500	50-500	50-700

TABLE III
Typical Specifications—DOUBLE-SCREW COARSE MATERIAL WASHER

Screw diameter, inches	30	36
Tub length, feet	18	18
Capacity, tons per hour	200 to 250	300 to 350
Max. material size, inches	2½	2½
Horsepower req. (electric)	40	50
Water req. (gpm. at 25 psi.)	600 to 800	700 to 900
Screw speed, rpm.	35	32

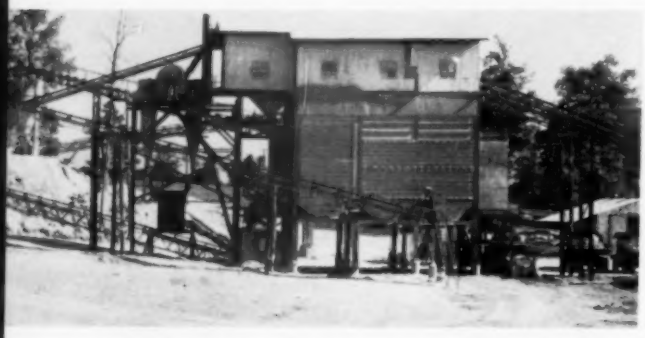
By ELWOOD MESCHTER



At right, high quarry face and overburden layer are shown in wide-angle view; note wagon drills and truck at work

Bottom photo shows, right to left, belt scale and clay-picking station on main conveyor, crushing-screening tower, and stave silo for sand plant raw material. Sand plant is in center rear, with its air separator and two sand storage tanks

Small photo below shows openings for trucks below nine rock storage bins, and two dust collectors



Here, crushing

Lambert Bros. designs,





dolomite eases a sand shortage

fabricates steel for its own 300 tph. aggregates plant

LIMESTONE SAND for sand-starved east Tennessee and a new supply of road building aggregates—these are the contributions of prosperous, aggressive Lambert Bros. Div., Vulcan Materials Co., to the economy of the Knoxville area. The company's 300-tph. limestone crushing and screening plant at Maryville is one of the most modern and efficient rock products plants in the South.

Lambert Bros. engineers designed the plant, and their own shop in Knoxville fabricated the steelwork. The cost of nearly $500,000 will pay off, as an energetic sales department moves the wide variety of sizes to a spreading network of highways and mushrooming markets of concrete products producers in the Tennessee Valley.

In the quarry, which has been in full production only a few weeks, clay removal from the stone is a major production problem. The stone is an outcrop of hard, blue Knox dolomite but the 250-ft. ledge has a massive overburden of typical red clay which has worked deeply into the fissures of the rock.

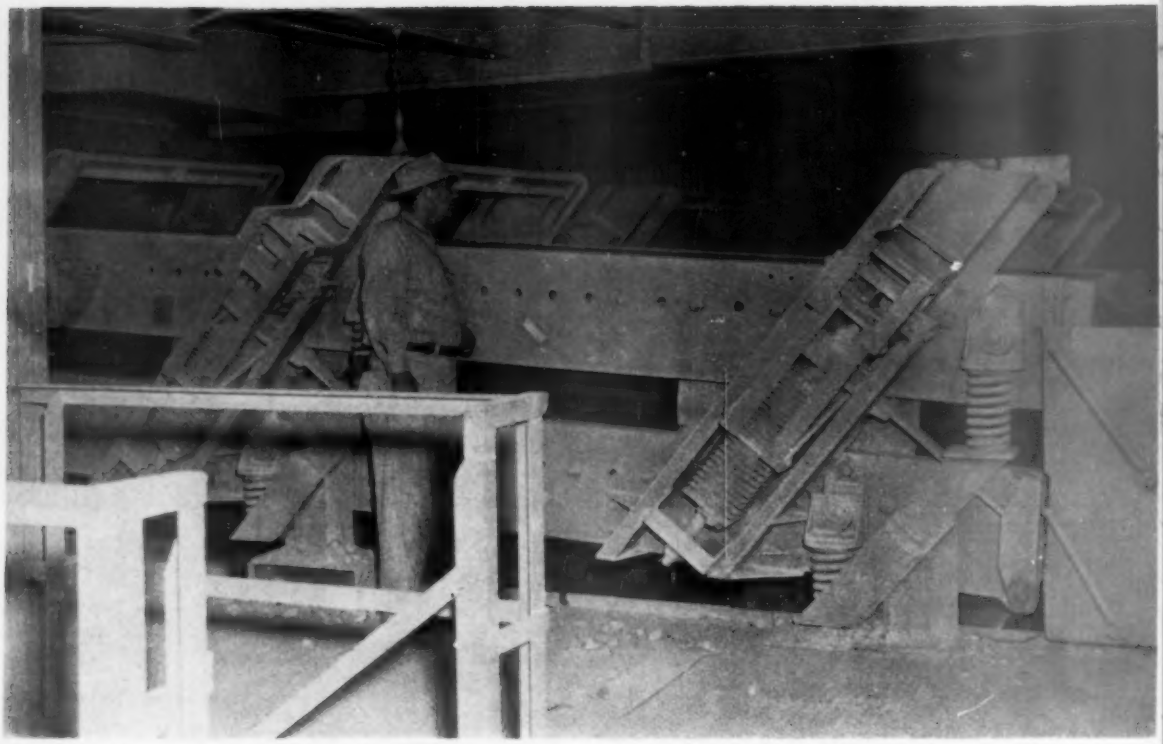
The overburden must be carefully stripped and hauled to a point where it cannot wash back into the quarry, and clay balls in the blasted rock must be removed by hand picking. Exacting stripping and hand picking yield high quality aggregates.

Heavy overburden in east Tennessee dictates deep quarries to keep stripping costs in line with production. This quarry is no exception. It will be worked in 30-ft. benches down to water, about 120 ft. deep. A pair of wagon drills prepares one face for blasting while a 2½-cu. yd. shovel works the broken stone from another face. A fleet of three end-dump trucks takes the stone from the face to the apron feeder ahead of the primary crusher.

The flow of material in the plant is as simple and as straightforward as the designers could make it. The placement of the conveying and screening machinery and storage bins was tailored to the contours of the ground. As a result, the primary jaw crusher is below ground level, but in a niche carved into the fill, so that it discharges to a collecting belt conveyor below. This inclined belt takes the minus 6-in. stone to the first screen, past a clay picking station and belt scale.

All screens in the plant are above the nine-compartment storage and shipping bin. Each of the three screens is a three-deck vibrating screen, giving a high degree of flexibility to the plant. Nine different products can be stored for shipment, and the screen cloths can be arranged to make nine sizes if needed. However, for everyday needs four sizes find the most profitable market—

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Two heavy-duty screens in the dry section of the Consolidated Rock Products Co. plant remove plus rock for crushing in the cone crushers. These screens are 6 x 22-ft., double-deck units

AGGREGATE REVIEW

What's new in the West?

By WALTER B. LENHART

BAD WEATHER AND NEW TECHNIQUES: these two phrases sum up the West Coast aggregates industry this year. Heavy and prolonged rains during the first three to four months delayed construction, but by May 1 the Pacific Coast and the 11 western states were producing at high rates; the year may end with a normal output. Up-to-date equipment—including HMS plants, water scalpers and liquid cyclones—plays an important role in this production.

Just as the weather broke, a dam on the San Gabriel wash east of Los Angeles was emptied to clear out some of the silt. This flood of water down the wash, plus the previous heavy rains, raised the water tables in several of the pits to a high level, filling the lower parts of the pits with water. One operator who normally worked a face about 200 ft. high had to be content with a face in the 70 ft. range. The rest of the pit was a large lake. Another operator, whose primary loading hopper and primary crusher were in a low part of the pit, had to abandon that section and mine from a face at the surface that was about 35 ft. high. Trucking in and out of the pits had to be re-routed. But by early summer the water troubles were easing.

In the Oakland area, producers were delayed by rains that were so prolonged and extensive that production was at a feeble pace.

Three heavy media plants are now in operation in California, all processing sand and gravel. In the same state, a fourth HMS plant is removing granite from dolomite. The first heavy media plant in the state was that of the S. P. Milling Co., Santa Maria (Sisquoc plant). The same company recently placed in operation another HMS plant in the Ventura area. The third is in the HMS operation of the Saticoy Rock Co., Saticoy.

The HMS plant at Sisquoc was enlarged during



A gyratory crusher in the quarry of Peck Road plant of GrahamBros. handles 1,500 tph. of gravel

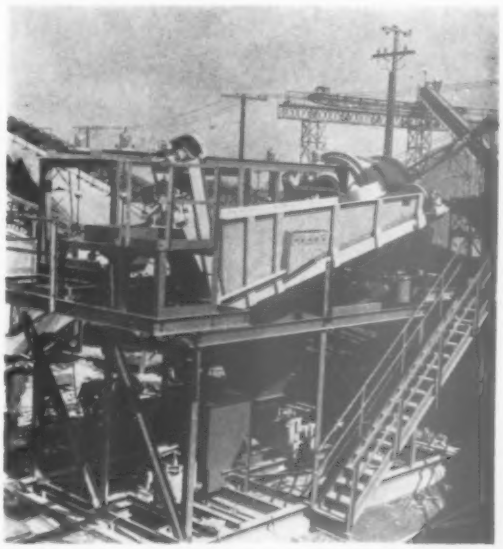
the year. The first section of the plant uses a 7 ft. diam. separatory cone. The newly added unit is a 6 x 6-ft., drum-type separator. A jig was also installed to process sand. The additions to the relatively new plant came about when the company secured a contract for a considerable tonnage of sand and gravel for Cook Air Base, a missile launching site.

The Corps of Engineers, U. S. Army, specified that the amount of material in both the coarse and the fine aggregates that had a sg. of 2.00 or less must not be over .5 of 1 percent. In other words, no more than 10 lb. of light material per ton of aggregate would be permitted. The jig and the HMS installations have made it possible to easily meet this rather strict specification.

The jig, a 5x 16-ft. unit, has a capacity of 60 tph. and uses a 7½-hp. motor. Light materials are wasted. The finished sand from the jig is shipped and has from .1 to .2 percent of light material in it—well below specifications. Magnesium sulphate losses were reduced from an allowable 15 percent to 8 percent.

The installation of the drum-type separator alongside the cone separator will give an excellent comparison of the relative efficiencies of the two types of separatory vessels. The new addition will about double the former production.

Other improvements at Sisquoc include the installation of a 5 x 14-ft. double-deck, dry vibrating screen over the primary surge pile to scalp out a dry sand.



The jig in the center foreground removes lighter material from the sand at S. P. Milling Co. Sisquoc, Calif., plant and easily meets Corps of Engineers specifications that call for sand with less than .5 percent material in it with a specific gravity of 2.0 or less. A drum type separator can be seen at the back

At Glen Canyon dam on the Colorado River an HMS plant using a spiral-type separator was installed, the first of its kind in a sand and gravel plant. This separator uses a machine very similar to the spiral de-watering unit common in sand production. In this unit the heavies sink and the

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The high bank at the rear is sluiced to the plant by use of two hydraulic monitors. Note the trash screen at the center ahead of the plant. This setup is located at the Felton sand plant of Central Supply Co., Felton, Calif.

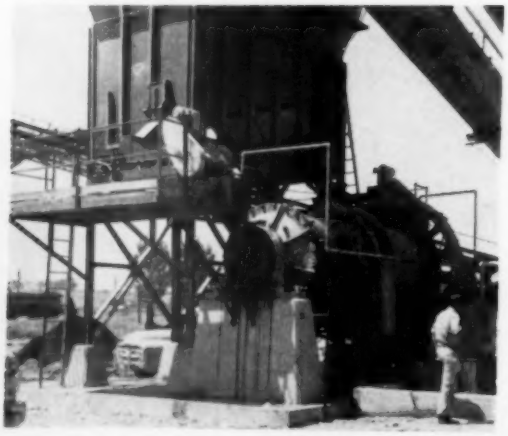
Aggregate review

continued . . .



Peck Road plant of Graham Bros. uses one of the largest shovels in the West—a 7-cu. yd. electric model

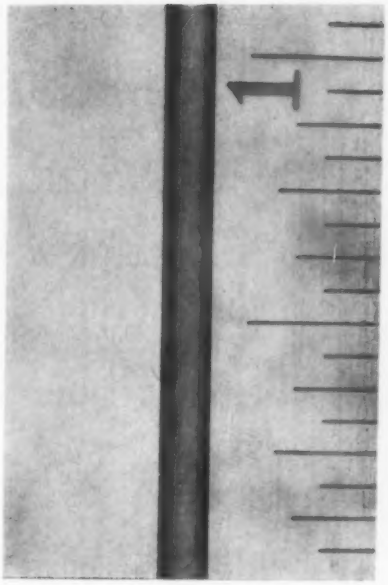
Rod mill for manufacturing sand is located at the Livermore Valley plant of Rhodes-Jamieson Co. near Pleasanton, Calif.



screw carries them up and away. The lighter portions float out the opposite direction. The results of this pioneering design are being watched with interest by the western producers.

The use of water-scalper tanks for sand classification has spread with considerable rapidity throughout the West. One of the first installations in California for this type of machine was at Felton. (This plant was described in the June, 1957, issue of ROCK PRODUCTS.) During the year several others went into operation, one in the Bakersfield, Calif., area and others at aggregate plants that are supplying sand for some of the large dams now under construction in the West. One dam builder, however, makes a satisfactory sand by hauling in a dry sand from a more distant pit and blending it into current production. On the Coast at least one rod mill and one ball mill went into operation during the fiscal year to manufacture sand so as to augment current production. The use of liquid cyclones for recovery of added fines from normal plant waste waters is becoming noteworthy and most producers are now aware of the unit's advantages. Super-scrubbers for washing coarser aggregates found several uses. The thousands of miles of excellently paved roads in the West testify to the benefits of the use of portable plants for processing sand and gravel.

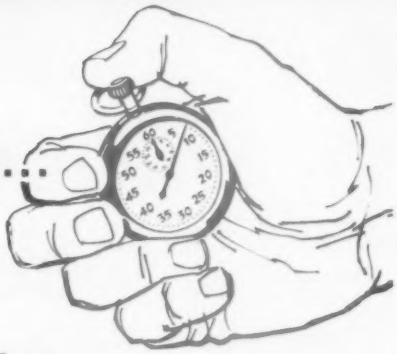
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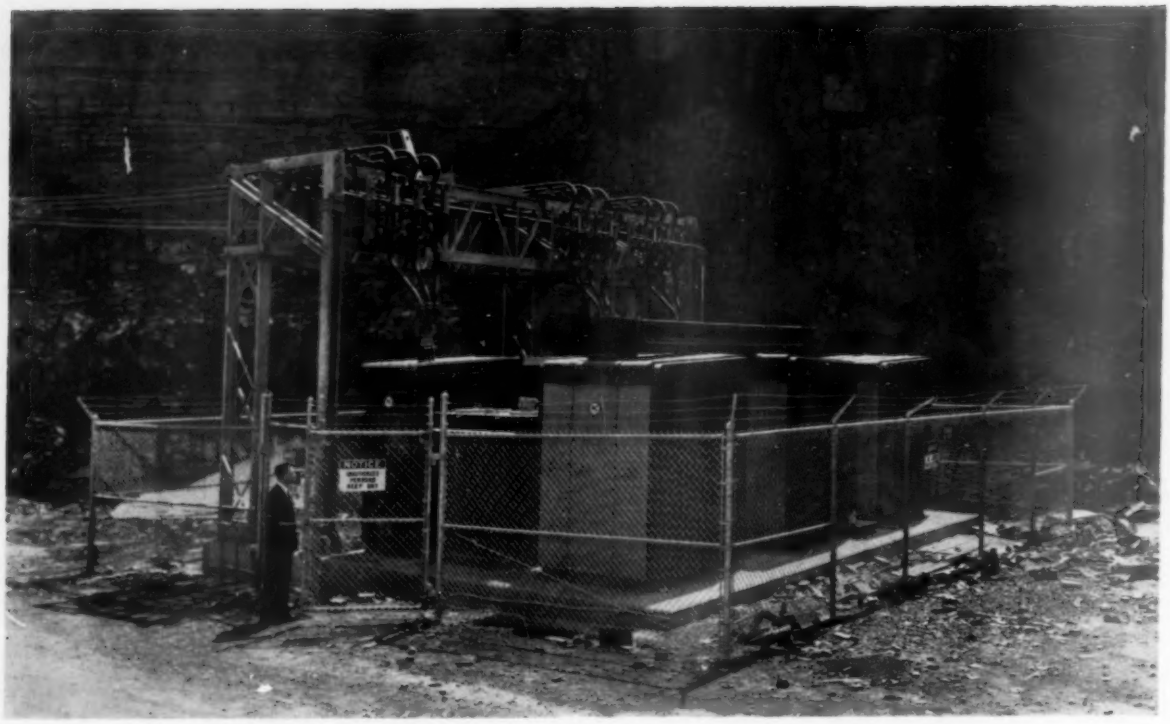
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SETTING UP A POWER SYSTEM?

. . . here are some tips to help you

By J. M. GASQUE and V. G. MURDOCK*

TO TRANSFER POWER EFFICIENTLY from a high-voltage power line to a rock processing plant's driven machines, careful planning is required. Transformer capacity, plant distribution voltage, voltage drop, cable sizes and circuit breaker ratings are important factors to consider in obtaining an economical power system. Future addition to a plant's load should also be anticipated.

Power for electrical loads in an aggregate plant or quarry operation is usually purchased at a voltage of 13.2 kv. or higher, depending on the voltage already available in the area and the electrical load to be added. Usually, this voltage is too high to be utilized by most motors connected to the distribution system; it must be stepped down to a lower value.

To obtain a lower voltage for primary distribution to load areas of the plant, the power line is terminated in a main power substation where transformers are connected to the line through a fused disconnecting switch. The fused disconnecting switch provides short circuit protection and a means of disconnecting the entire aggregate plant from the power line for maintenance.

For an aggregate plant, a transformer 5,000 kva. or larger may occasionally be found necessary to supply the connected load, but sizes of 2,500 and 3,750 kva. are more common. The size of the power transformer in kilovolt-amperes is determined by:

- Load factor of the plant
- Power factor of the load
- Total electrical load connected to the system

Most new plants use three-phase transformers connected either delta-Y or delta-delta, although three single-phase power transformers connected in a three-phase bank may be found in some plants.

With a delta-Y connection, the neutral of the Y should be brought out and grounded solidly or through a resistor. This arrangement limits a ground fault current to a value less than would be found on a solidly grounded system. If a delta-

Please turn to page 106

*Electrical Application Dept., Allis-Chalmers Mfg. Co.



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The contractor was working on an 8 mile section of U.S. 81 in McLennan County. Fred Hall, Jr. reports maximum availability during the month with regular servicing being the only maintenance required for their 100% Euclid fleet of haulers.

The Model R-15 "Euc" used on this rock crushing job has a rated payload of 30,000 pounds, 10½ cu. yd. struck capacity, 218 h.p. engine, five speed transmission, hydraulic booster steering and 14.00 x 25 dual drive tires.

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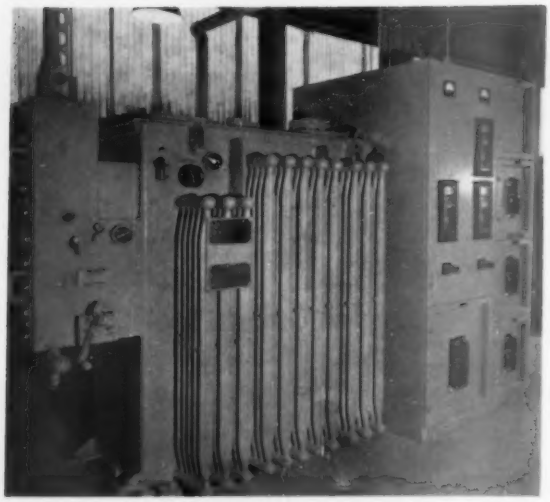
- **KENNEDY** Stone Preheater
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Crushing and screening towers are electrical load areas typical of rock plants. Here as many as 10 motors are concentrated in a small area



This 750-kva. load center substation consists of a transformer and low voltage switchgear (below 600 v.) in a complete unit. This type of equipment has been found economical to install in areas of concentrated electrical load

Power system requirements

continued from page 102

delta transformer is used, a zig-zag grounding transformer is sometimes connected to the secondary, in order to obtain a neutral point to ground the power system when grounding is preferred.

Grounding power systems is not essential. It does, however, make relaying of faults more effective, gives better protection to connected equipment and may provide greater system continuity. In all cases where a delta-Y transformer is used, the system should be grounded, since on some faults it may be possible to get full line-to-line voltage across one phase of the transformer. This may damage the winding if the Y is operated ungrounded. The use of a delta-delta transformer may result in more expense if grounding is desired, since additional equipment must be purchased to obtain a neutral point.

Power reliability in aggregate plants is essential. By connecting a bank of three single-phase transformers delta-delta to the power line, power reliability is increased. If one of the single-phase transformers should fail, the remaining two could be connected in open delta and loaded to 57.7 percent of the three-phase bank capacity.

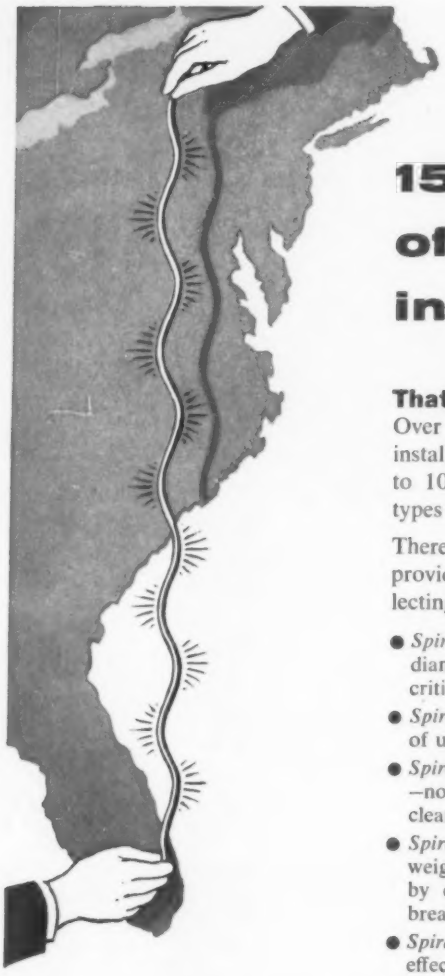
Where production requires full capacity most of the time, four single-phase transformers can be installed, connecting three either delta-Y or delta-delta and keeping the fourth as a spare. If one of the single-phase transformers should fail, the spare can be quickly installed and full power capacity to the plant maintained. In either case, power must be interrupted for a short period of time. These two arrangements may also be used in remote plant locations and where repair service is difficult to obtain. Power reliability within a plant is considered greater when using single-phase transformers instead of a three-phase transformer since, should a three-phase transformer fail, the entire plant would be without power, unless the transformer could be repaired or replaced immediately. Reliability of modern three-phase units is generally considered almost equal to three or four single-phase transformers. And a substantial premium must be paid for the small increase in reliability assumed gained through use of single-phase units.

Voltage selection is important. A voltage must be selected for primary distribution of power from the secondary of the transformer to the load areas of the plant or quarry. A primary distribution voltage of either 2,400 or 4,160 v. is common. Factors to consider when selecting voltage are:

- Magnitude of load in load areas
- Distance of the load areas from the main substation
- Anticipated the future load to be added in any area

The voltage selected to supply power to load

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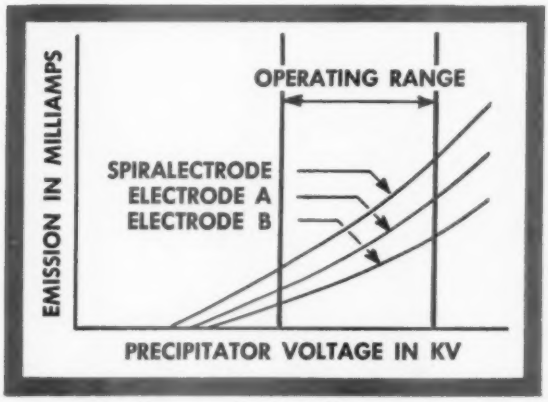


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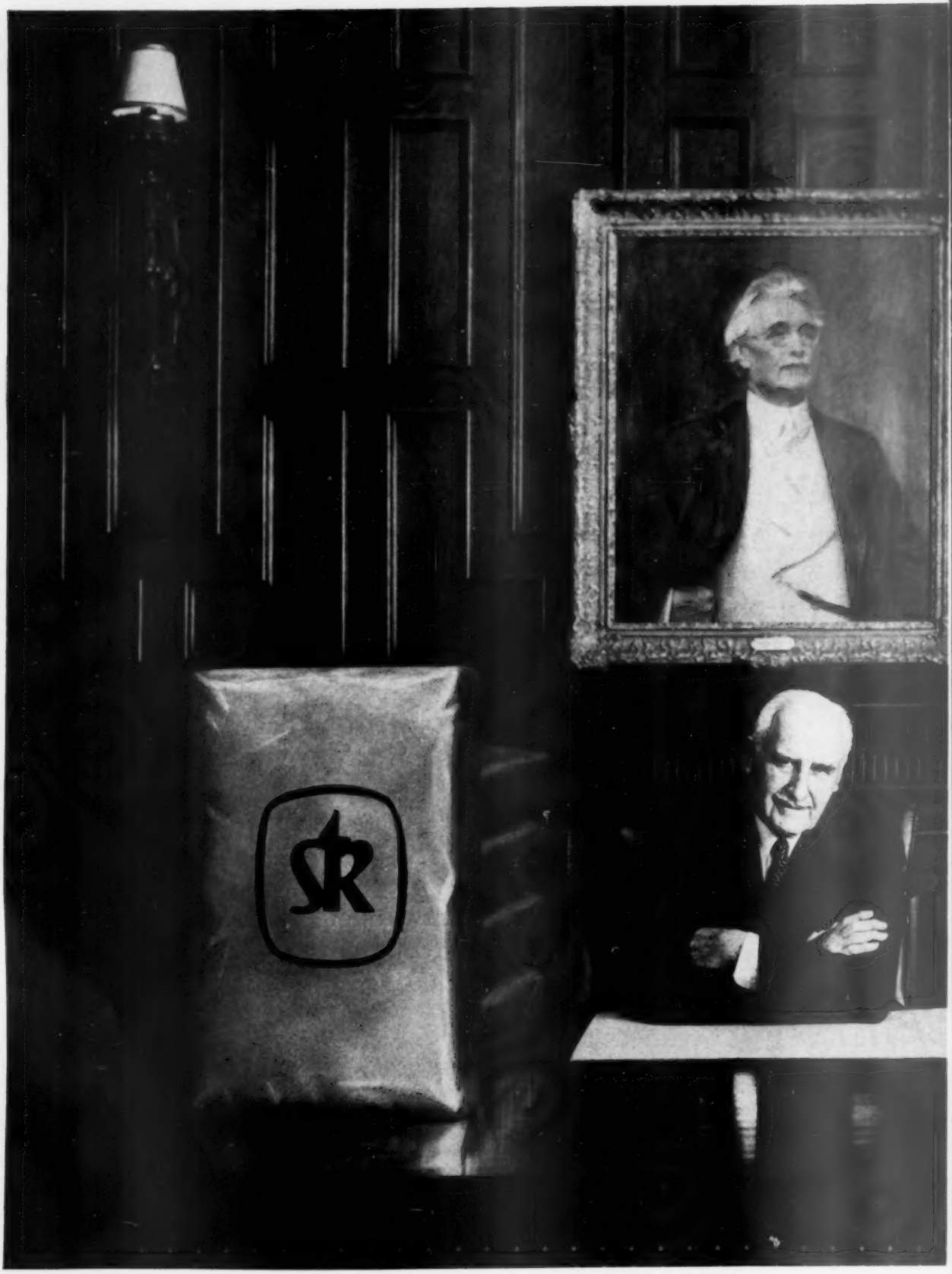
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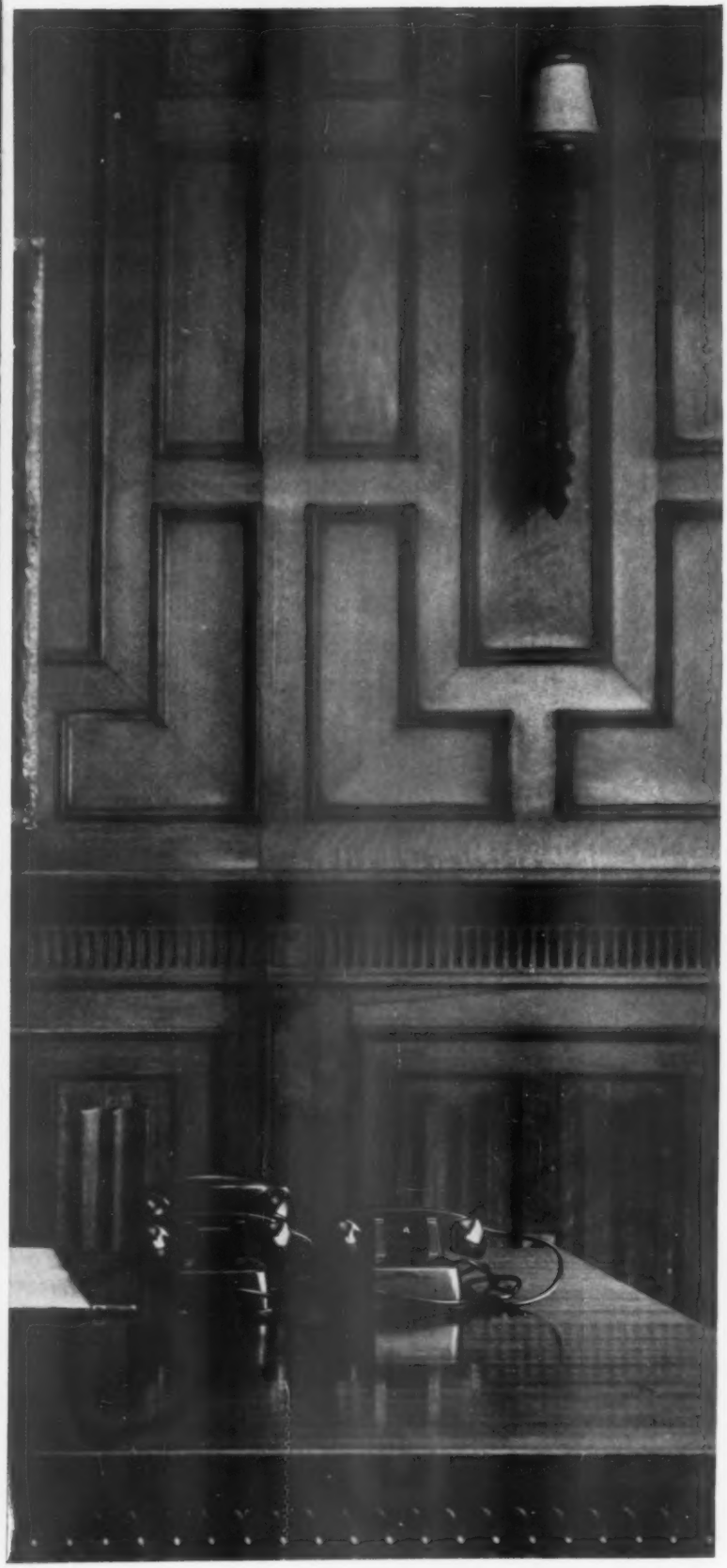


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For the future, you can be sure of this:

You can continue to look to St. Regis for improvements in cement packaging . . . bags that are even cleaner, machines that are more efficient than ever before.

This promise can be made for just one reason; the Cement Industry's purchases of Multiwall Bags permit St. Regis to carry on the costly developments that will better your packaging of cement and lower your costs.

This is the capital return that comes built into every St. Regis bag you buy.

St.Regis PAPER COMPANY
150 EAST 42ND STREET, NEW YORK 17, N.Y.
MULTIWALL PACKAGING DIVISION

Enter 1565 on Reader Card

Why Cat Diesels are sand, gravel



The towboat *Iron City*, moving sand and gravel from dredge to plant for the Iron City Sand & Gravel Corp. of Pittsburgh, is 100% Caterpillar powered. Operating on the Monongahela, Allegheny and Ohio Rivers, the craft is 90′ long with a 26′ beam and 8′6″ draft. It is capable of 6 MPH with a full load of 6,000 net tons on 12 barges.

WHEN you make a living moving and processing gravel and rock products, no *one* reason for purchasing a particular power package is enough—too much depends on it. Usually the owners of Cat Diesel Engines can give you a number of reasons why Cat power is best, and they speak from first-hand experience.

Take the towboat *Iron City* for example. The Iron City Sand & Gravel Corp. of Pittsburgh, Pa., powered it 100% with Cat Engines. Says Vice President C. A. Bickel, "We decided on Cat power for the *Iron City* because of our complete satisfaction with the performance of Cat Engines on our dredge—good power, parts availability and service. Also the general reputation of Caterpillar Engines was so good, we felt sure we would experience the same fine results as other owners."

And the H. L. Seabright Company of Wheeling, West Virginia, relying on Cat power for dredging—a D17000, a D13000 and a D375—says this: "We especially like the ease of maintenance and fuel economy of our Cat power plants. . . . We bought Cat Diesels in the first place because of parts availability, service, price, and our fine experience with other Caterpillar equipment." The quotes are by Ralph Brinker, Maintenance Supervisor.

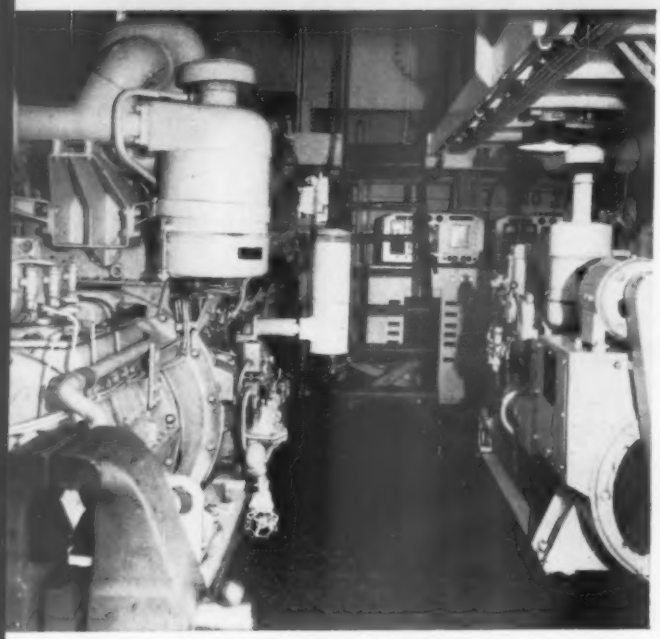
The entire Cat Diesel line is designed for long life under severe operating conditions. These engines are rated to deliver the horsepower advertised—no backing off from the load. This is why you will usually find Cat Engines where there is hard work on a non-automotive application.

If you want reliable power, matched to your load and job conditions—designed to deliver full production, see or call your nearby Cat Dealer for a demonstration.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

first choice with and rock companies

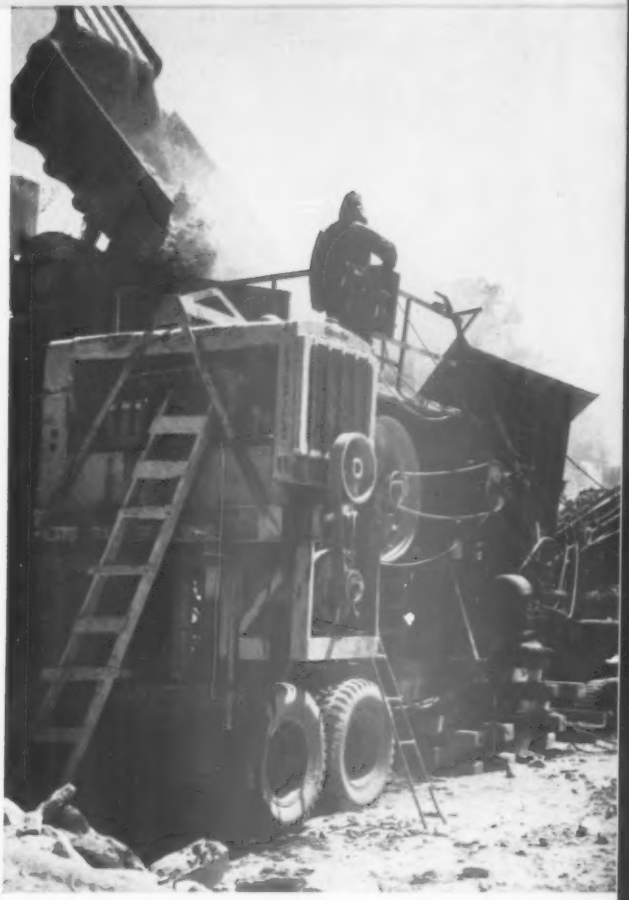


Two Cat D397s provide propulsion power and two Cat D311 Electric Sets furnish all electric power for the towboat *Iron City* which handles barges of sand and gravel totaling 100,000 tons per month.



On dredging operations near Glendale, West Virginia, the H. L. Seabright Company uses a Cat D375 Electric Set to power a Simplicity and Deming washer; a Cat D13000 Engine to drive a Stedman crusher; and a Cat D17000 Engine to drive a Thomas suction pump. Capacity of this dredge is about 1,200 tons per day. Maintenance Superintendent Ralph Brinker says, "The maintenance of these engines is easy and they are economical to operate. Cat power on our rig has proved very successful!"

BY CATERPILLAR



One of four Cat D13000 Diesel Engines furnishing power for the Hector Construction Company's crushing operations (Caledonia, Minn.). Regularly operating in four quarries, this company here is preparing ¾" road aggregate for its own construction road work. Says C. C. Neilsen, secretary: "Our experience with Cat Engines has been outstanding. A D13000 Engine on this crusher has paid for itself many times over in fuel and maintenance savings alone. This kind of long life and low operating cost pays off year in and year out!"

Engine Division — Dept. RP10
CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Send me more information about Cat Engines for original power and repowering.

☐ Have your dealer call for an appointment. I understand that I am under no obligation.

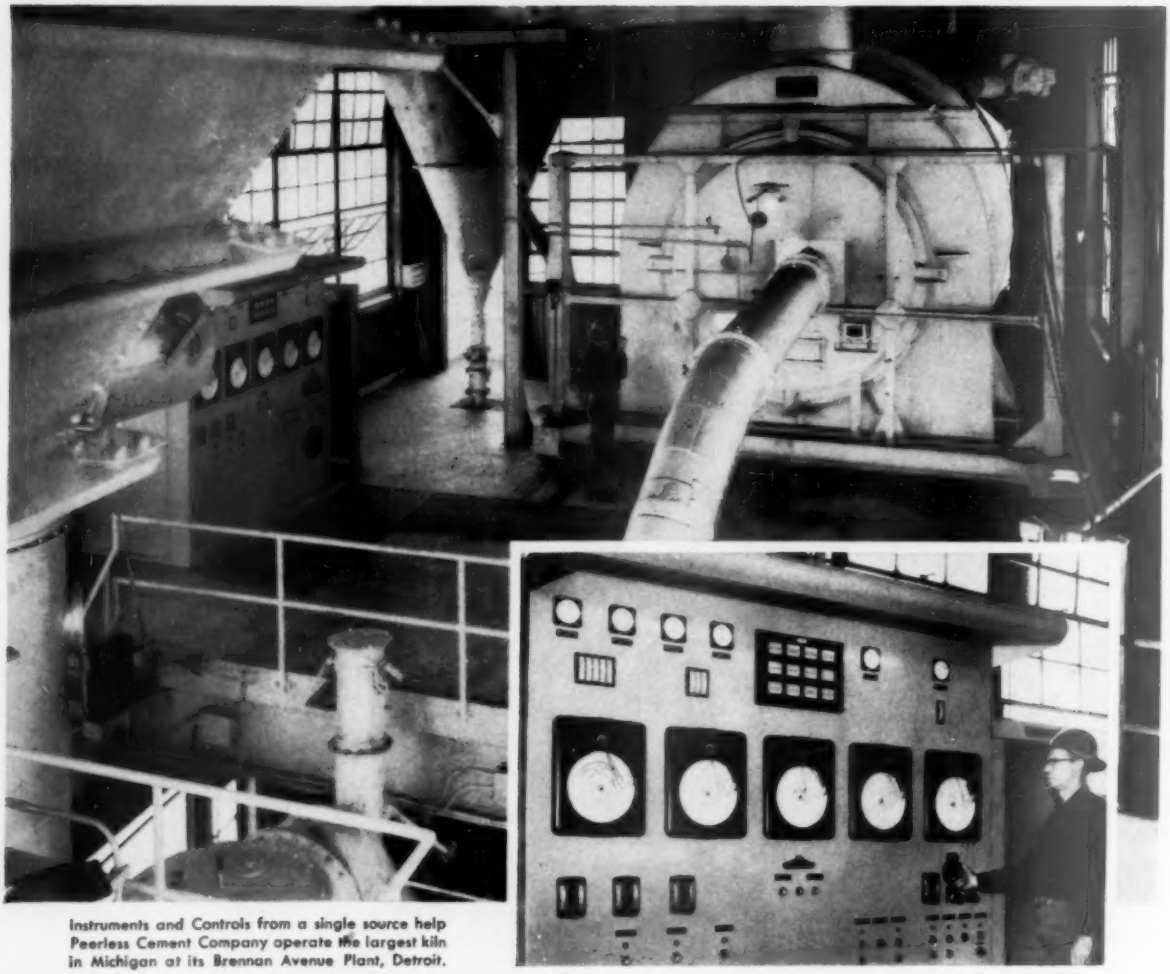
☐ I am interested in learning more in general about these engines.

Name _____

Company _____

Address _____

City _____ Zone ____ State _____



Instruments and Controls from a single source help Peerless Cement Company operate the largest kiln in Michigan at its Brennan Avenue Plant, Detroit.

This giant kiln gives peak performance <u>longer</u> with Bailey Controls

The Peerless Cement Company of Detroit demands maximum capacity, uniform production and low fuel rate from its largest kiln . . . and Peerless gets it!

They do it with a Bailey Control System that gives them complete control of combustion, clinker cooler, and other kiln variables.

The system keeps continuous chart records of 11 important variables, including temperatures, drafts, air flow, kiln speed, fan speed, % oxygen, and % combustibles.

All this is done so dependably that the kiln often makes week-long runs without being touched.

All recording receivers in the Bailey System are plug-in components—easily removed, regrouped, or replaced to meet changing requirements. Additional records are added simply by plugging in receivers on existing recorder cases. Your Bailey Engineer can help you plan for peak performance — call him or write for your Bailey Kiln Control Folder.

C115-1

BAILEY METER COMPANY

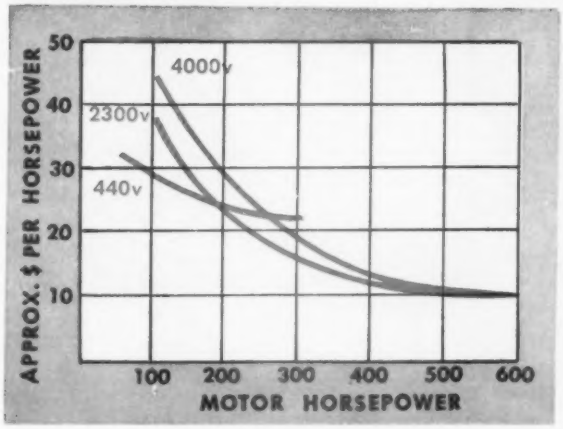
1039 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

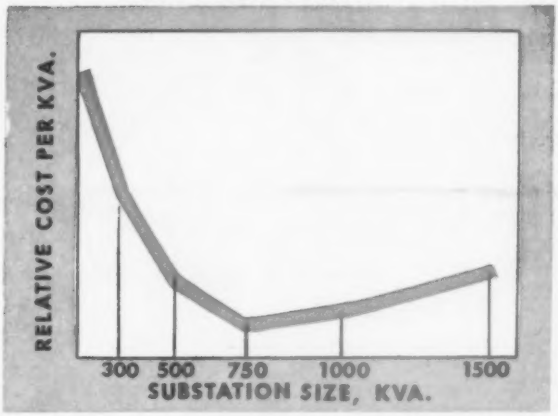
BAILEY METERS

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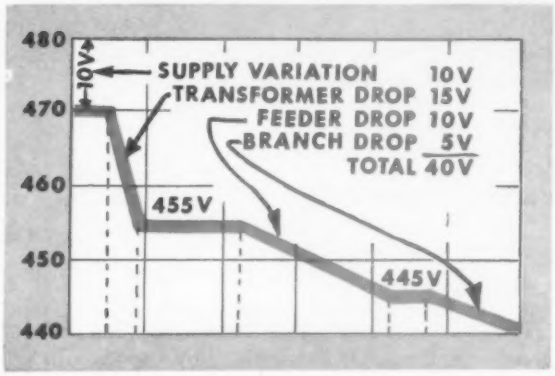
Motor cost comparison for 440 v., 2,300 v. and 4,000 v.



Relative cost of LCS substation (480 v. secondary)



Voltage profile of a typical system



Power system requirements

continued from page 106

areas of the plant will determine the amount of current that will be drawn from the power line for a given load and this, in turn, will determine the cost of cables and distribution equipment applied to the system. If 4,160 v. is selected instead of 2,400 v., the resulting load currents will be approximately 58 percent of the current drawn from the line at 2,400 v. Therefore, the cost of cables required to transmit the power to a load area would be reduced, since smaller cable sizes could be used.

This saving is offset by the fact that motors and motor controllers are more expensive for 4,160-v. systems than those required for a 2,400-v. system.

If a large load area is located quite a distance from the main substation, 4,160 v. may be the most economical voltage to use. Should 2,400 v. be used, the current drawn by the load may be so large that, unless very large cable sizes are used, the voltage in the load area may be low due to the voltage drop in the cable.

The same explanation could be used for the future addition of load in a load area. If 2,400 v. is selected for present plant operation and load is added in the future, a low voltage condition may exist because of the higher currents drawn. The effects of low voltage will be discussed later, but it should be pointed out here that the primary distribution voltage to be selected for a particular plant should be determined only after a study is made of the plant layout, the connected load and future considerations for expansion.

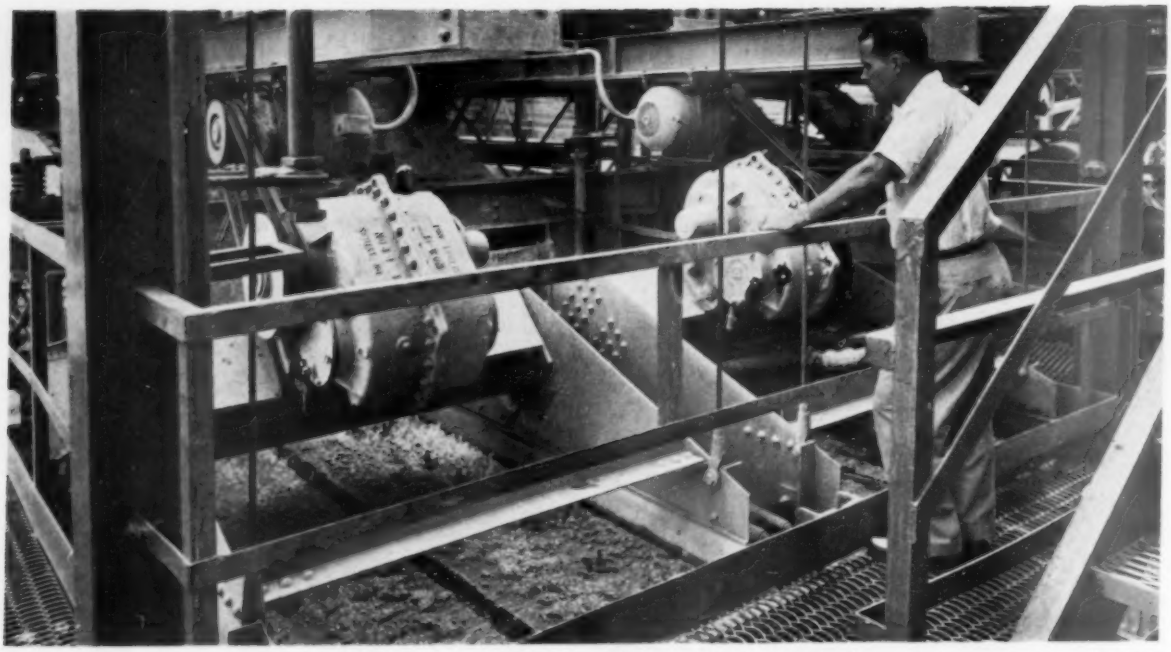
To determine the most economical application of power equipment to a distribution system, both the plant layout and the connected load in a plant should be studied in order to arrive at primary and secondary distribution voltages.

Cost Comparison of Three Transformer Systems
(Figures based on an outdoor installation using oil-filled, self-cooled transformers)

	Relative Cost
One three-phase transformer	$1.00
Three single-phase transformers	1.15
Four single-phase transformers	1.53

Primary distribution feeders to supply load areas of the plant are usually tapped off a main power bus connected to the secondary of main power transformer. Metal-clad circuit breakers are used to provide short circuit protection for the feeders and a means of disconnecting the feeder from the power source. In order to apply circuit breakers to a power system, the magnitude of a fault on a feeder circuit should be determined.

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While electrical system load may be less for such applications as screening, the number of screens which might be added later should be anticipated

Power system requirements

continued from page 113

The short circuit megavolt-amperage for a fault on a feeder circuit is determined by the amount of megavolt-amperes the power company's line will furnish to a fault on a feeder and the impedance of the main power transformer. The short circuit mva. available from the power line must be obtained from the power company, since this value is affected by the type and quantity of power equipment connected to the line by other industrial customers of the power company. The impedance of power transformers ranges from 5.5 to 7 percent and limits fault mva. according to its value.

As an example, assume that a power transformer is 2,500 kva. with a 5.5 percent impedance, and the power company can furnish 400 mva. to a fault. The short circuit mva. at the fault, neglecting feedback from motors within the aggregate plant, is approximately 41 mva. Therefore, any circuit breaker applied to this feeder must be capable of interrupting 41 mva. and should be rated above 41 mva., since the motor feedback from within the aggregate plant should be added to this figure. If the size of the plant is to be later expanded to twice its present size, requiring another 2,500-kva. power transformer, the mva. available at a fault on a feeder will be considerably increased. This, too, should also be considered when applying circuit breakers.

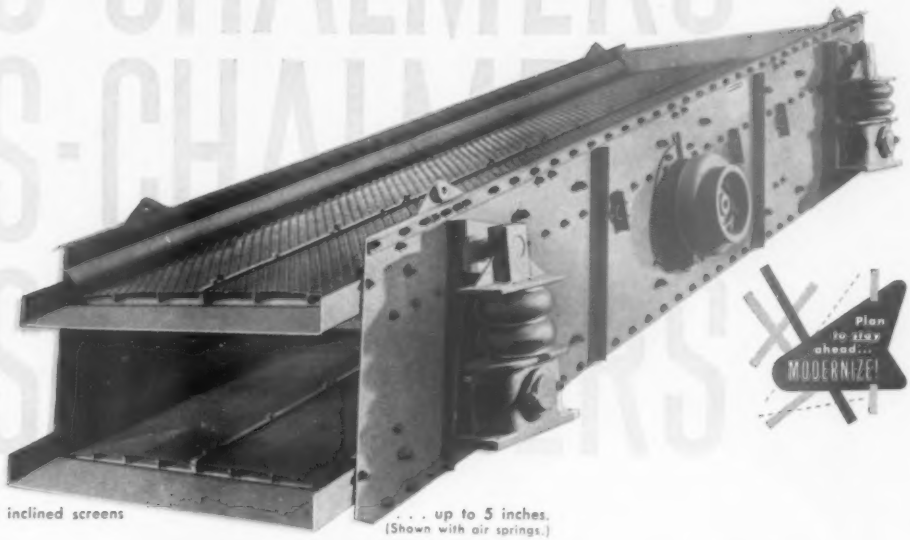
To detect fault currents, relays are connected in the feeder circuits by means of current and potential transformers and contacts from these relays are wired into the trip coil circuit of the breaker. If a fault is detected on a feeder by a relay, the relay is energized and the breaker is tripped, isolating the fault from the power source. Some of the most common relays used for protection of feeder circuits are instantaneous and time overcurrent relays, over and under-voltage relays, thermal relays and phase balance relays.

The load in an aggregate plant consists mainly of induction motors ranging in size from 1 to 500 hp. Although the voltage chosen to supply this load may occasionally be the same as that used for the primary distribution power, a lower voltage is more economical for most of the motors connected to the power system.

It would cost less per horsepower to supply power to motors below 200 hp. at 400 v., as the cost of these motors and motor controllers at this voltage is less than at 2,300 or 4,000 v. It would be more economical to supply power to motors above 200 hp. at either 2,300 or 4,000 v., since the cost of these motors and motor controllers at this voltage is less per horsepower than for a voltage of 440 v.

Since most of the motors required in an aggregate plant are rated below 200 hp., some means of supplying 440 v. must be obtained.

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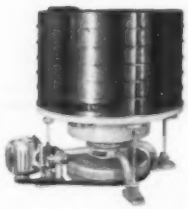


Standard inclined screens . . . up to 5 inches. (Shown with air springs.)

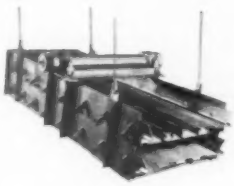
SCREENS

world's most complete line!

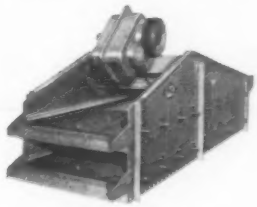
separations from 12 inches to 325 mesh



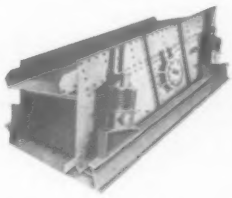
All-metal gyratory screens . . . 2 to 325 mesh.



Small inclined vibrating screens . . . 1½ inches to 40 mesh.



Horizontal vibrating screens . . . up to 2½ inches.



Heavy duty scalping screens . . . . up to 12 inches.

Expert application help. Allis-Chalmers not only offers the most complete line of dependable, high-production screens, but also provides expert counsel based on unequaled experience in screen applications. In addition, modern pilot plant facilities are available for test runs of difficult or untried materials, if necessary.

For your copy of valuable screen selection guide, 25C6177M, write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

Suspended or floor mounted, or supported on air springs.

Inclined or horizontal.

Wet or dry operation.

Screens for hot materials handling.

Dustproof enclosures.

Electrical and mechanical anti-blinding devices.

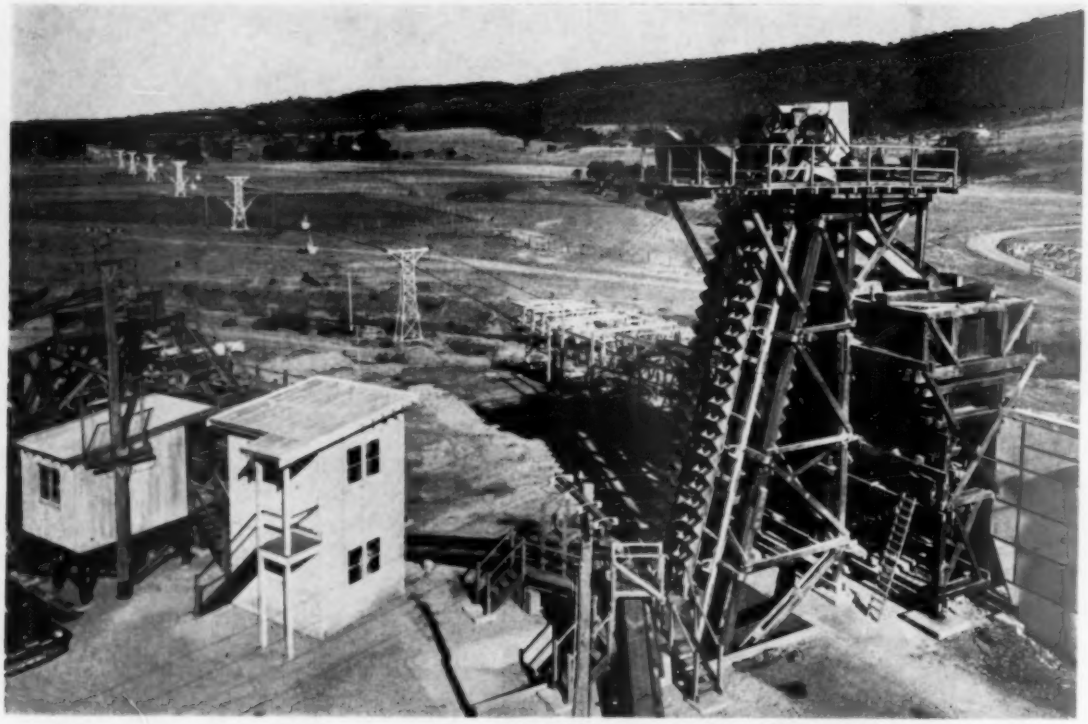
Screens designed for special applications.

And you get your screen complete with motor, drive and control — all built by Allis-Chalmers.

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A-5819

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Bucket elevator, and aerial ropeway which it loads, shown at work

Aggregate for Aussie dam carried twelve miles on aerial ropeway

By LEO WALTER

ON THE WARRAGAMBA RIVER, which flows through a steep, narrow gorge in the foothills of the Blue Mountains of New South Wales, the largest mass concrete dam in Australia is being built by the Metropolitan Water Sewerage and Drainage Board of Sydney.

The Warragamba dam, scheduled for completion in 1959, will be of straight gravity section, 445 ft. high from foundation to crest and 1,300 ft. long, and will contain 1½ million cu. yd. of concrete.

Aggregates for this mammoth project are being provided by a sand and gravel processing plant operated by the Sydney Water Board. The aggregate is obtained from a deposit of water-worn gravel and sand at McCann's Island, 12 miles from the dam site. The plant for the working and grading of the raw material was designed by the Board's staff and was ready for operation by March, 1953. To date, some 2,201,000 tons of aggregate have been processed out of a total requirement of about 2½ million tons.

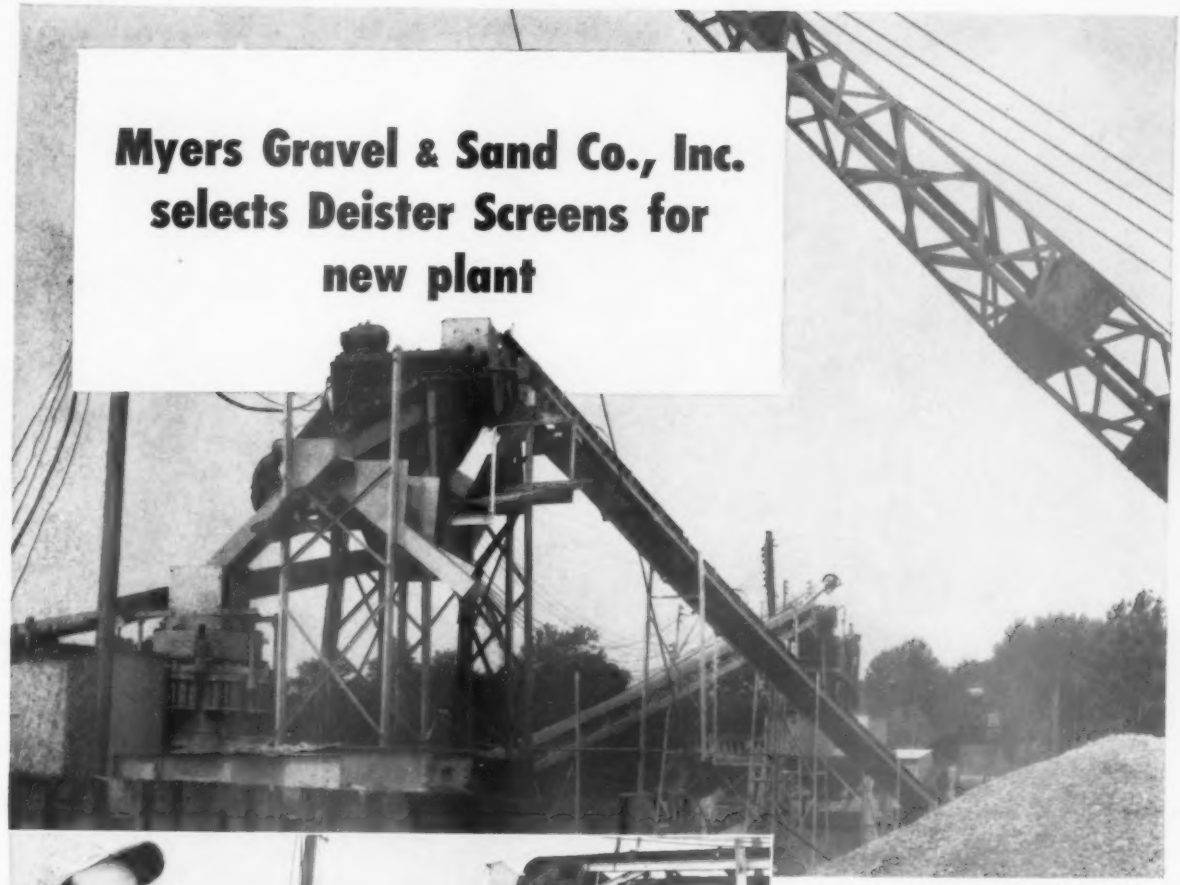
Aerial ropeway. The plant produces sand and gravel in clean, accurately-sized grades. It delivers the material to a double-cable aerial ropeway which runs to the dam. Some 550 buckets, each bearing a load of nearly 1½ tons, travel on the ropeway and discharge into storage bins or stockpiles, from which the aggregate is carried by belt conveyors to the central mixing plant as needed.

The aggregates plant can supply any required mixture. Besides the limited amount that can be stocked at the dam, the processing plant contains enough storage to supply continuously three shifts a day, although raw material is dug and fed to the plant on a two-shift basis.

The size of the stockpiles also provides for such

Please turn to page 118

Myers Gravel & Sand Co., Inc. selects Deister Screens for new plant





Seventy-five years of "know-how" in the production of aggregates to exacting specifications went into the planning of Myers' new plant at Anderson, Indiana, approximately one mile north of their present main plant. Before specifying their new vibrating screens, Mr. Robert Myers, Vice President and General Manager, and Superintendent Alex Faulds visited other outstanding producers in the Midwest to see for themselves if the reports on the performance and efficiency of Deister Screens were accurate.

What they saw convinced them. Plant owners and superintendents alike confirmed that Deisters are big capacity screens, ruggedly built to run day after day, year after year, without downtime.

Myers installed their first Deister in their partially built plant . . . a Type UHS triple-deck 4′ x 10′. It did such an outstanding job, handling up to 190-200 tph, that the second Deister, a double-deck 4′ x 8′, was immediately ordered and installed.

If you plan to expand or modernize your plant to meet today's rigid specifications, we invite you, too, to talk to Deister owners. Learn how you can benefit from such exclusive Deister features as Adjustable Slope Panels . . . Unitized Life-time Vibrating Mechanism with oil-mist lubrication *and* Deister's Opposed Elliptical Throw which controls movement of the material on the screen for greatest sizing speed, accuracy and maximum production. Write for recommendations on your screening problem.

Top: Overall view of new plant with Deister triple deck 4′ x 10′ screen in foreground.

Below: Superintendent Alex Faulds and the Deister double deck 4′ x 8′.

DEISTER MACHINE CO.
1933 E. Wayne St., Ft. Wayne, Ind.



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View of head end of gravel plant shows conveyors and sized aggregates

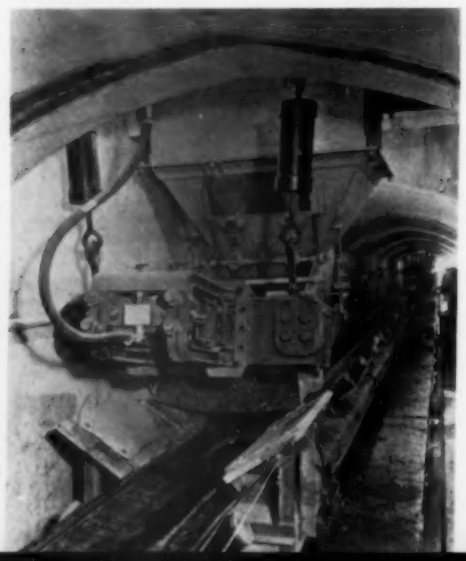
Australian dam

continued from page 116

emergencies as interruption of supply by floods and occasional variability in the supply of some sizes in the gravel deposit. The planned delivery to the dam is 170 tph.

Classifying setup. The feed, taken from the primary hoppers by a conveyor, contains boulders up to 10 in. Since the largest size of stone required at the dam is 6 in., this conveyor delivers to a screen which separates out the boulders over 6 in. and delivers them to what is labeled stockpile A. The minus 6-in. material passes to a second conveyor and is carried to screens which divide it into three fractions.

Vibrating feeder is shown in tunnel under stockpile



Plus 3-in. material travels to the left on a conveyor and is heaped by a radial stacker into stockpile B. Material between 3 and 1½ in. travels to the right and is stacked into pile C. Minus 1½-in. material proceeds to the next screens. There to prevent blinding, it is screened wet and again divided into three, gravel over ¾ in. being stacked at D; over ⅜, on the right.

The minus ⅜-in. gravel is dropped into a concrete sump, from which it is carried by water through a pipe to an elevated tank. The larger material is stacked as before. Some of the sand is put on a conveyor, which discharges by a traveling tripper onto a long heap; the silt is pumped to waste. In this way stocks are built up of five sizes of gravel and one of sand.

The boulders which were screened out after leaving the first conveyor are crushed to minus 6 in. and carried to screens. The 6 x 3-in. stone is stockpiled. The minus 3-in. material is conveyed to a series of crushers and screens, and it can be joined by stone drawn from either of two piles for reduction, if necessary, to a smaller size. In this

Please turn to page 160

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Why use separate machines and operators on scattered tractor jobs?

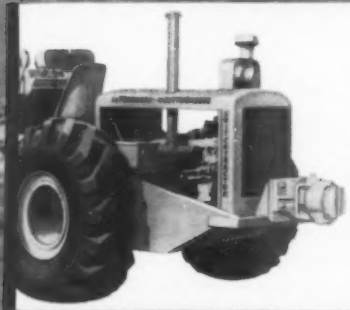


Handle your widely-separated pit maintenance and clean-up jobs swiftly and economically with one man and a LeTourneau-Westinghouse Tournatractor®. Rubber-tired tractor speeds to the job under its own power . . . over RR tracks, paved roads, down shot banks, or cross country. There are no delays for load-and-haul to new locations.

L-W tractor gives you better speed at the work area, too. Acceleration is fast, with 210 hp operating through sealed anti-friction drive. Maneuverability is quick and easy. Also, there's no loss of momentum to shift gears, because this tractor's gears are constantly in mesh. Even reverse action is *instant*.

Handles wide variety of jobs

You can use Tournatractor to clean around 2 or more shovels . . . to maintain stockpiles, level waste dumps, clean debris off RR tracks . . . to clean benches, handle shallow stripping . . . to tow air-compressors, or pull supply and service wagons. You can even use this speedy, mobile tractor for maintenance and clean-up in one or more adjoining pits.



With standard type E railway coupler — one of ten multi-service Tournatractor attachments available — this speedy, powerful tractor becomes a versatile off-track switcher, as well. Use it to spot and group rail-cars fast. Big tires on SwitchTractor† straddle rails, ride on ballast and tie-ends — deliver *double* the tractive effort of steel-wheeled switchers, rolling on smooth steel rails.

Biggest tractor value today!

In addition to giving you these plus operating advantages, LeTourneau-Westinghouse Tournatractor *costs less* than a track-type tractor of comparable horsepower. Let us demonstrate this rubber-tired tractor at your pit. Watch it perform under *your* working conditions. You'll find it can handle scattered tractor jobs faster, more efficiently, to help cut pit costs.

†Trademark CT-1865-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



NCSA board members meet to plan for future progress

Crushed stone association reports on expanded services

THE NATIONAL CRUSHED STONE ASSOCIATION is more than keeping pace with the growing and changing industry it serves. It has expanded its staff and activities in several directions, and results—after a year of hard work at an increased tempo—are wholly on the favorable side.

The decision in February to become more active on legislative matters concerning the industry has proved to be a three-way beneficial move. Congressmen now have better access to industry opinion on legislative bills that concern the industry. The Association has accented its important position as representing a major industry. And individual members have benefited through the flow of more information on national legislative matters through Association headquarters.

The Engineering Staff of NCSA, now enlarged, is able to give more service to individual members. In addition, NCSA has been able to expand its important research work on problems that are becoming more and more important to the industry.

Communications between headquarters and members have been improved, resulting in a better informed membership. Association Committees have been most active on special subject areas of importance to Association business and industry operations. The Board has been successful in improving, after detailed study, the financial status of the Association. NCSA's Manufacturing Division also has been able to count advances in organization and operation. The exposition held in February of this year was the largest and most successful ever held.

The Board of Directors met to hear reports on the state of the Association and to continue plans for future progress July 24-25 at The Homestead, Hot Springs, Virginia. About 50 members were on hand, and all rolled up their sleeves for a full two-day working session. The meeting was capably chairmanned by O. E. Benson, NCSA president, with a most able assist from the Association's executive staff.

A resume of the progress made by the group was given by Mr. Boyd in his report to the Board. After highlighting the new legislative program—explained later in detail by J. F. Lane, NCSA counsel—Mr. Boyd specifically recounted the advances made by the Cost Accounting Committee, the Quarry Efficiency Program, Accident Prevention Committee, and others.

Interest in efficiency by crushed stone producers is growing. The present program of the group, started just a year ago, has been enlarged. Mem-

Please turn to page 122

Enter 1474 on Reader Card



Miami Copper Company's 150 hp Adams 660 grader handles all grading at their Copper Cities Mine, Miami, Arizona. Grader maintains haul and access roads, benches, and pit floors in 3rd gear (speeds to 4.7 mph).

1 man, 1 grader handles haul-road maintenance at Arizona pit

Miami Copper Company mines 24,000 tons of rock and ore per day at its Copper Cities Division pit, Miami, Arizona. To transport this material, nineteen 30 to 40-ton trucks are used. An average of 8 trucks per shift pound 3 miles of haul and access roads 24 hours a day, 7 days a week. To keep these roads and 6 miles of outside roads, plus benches, and pit floors in high-speed-hauling condition, the mine relies on only 1 grader, working only 1 eight-hour shift 6 days per week. It is a 150 hp Adams* 660.

Maintains roads in 3rd gear

With Adams' standard 8 forward and 4 reverse speed transmission (3 optional "creeper gears" also available), grader operator always has "just-right" power-speed ratio to handle any job fast and accurately. On haul-road maintenance, Adams 660 works at speeds to 4.7 mph, in 3rd gear. Grader levels ridges, fills ruts, and improves drainage. Adams' 26 mph travel-speed pays off, too! Unit is never more than a few minutes away from any assignment around the pit area.

"Handles jobs twice as fast"

Said operator T. S. Ashford, "I like the power of the '660'. I can do a job twice as fast." Ashford also added, "I like the controls. I can work two controls (lateral shift and circle) at same time, with one hand, on turn-around . . . can get going fast!"

Smooth, accurate control from cab

On the Adams 660 (as on all Adams models), all blade-positions are *power-controlled* from the cab. Operator has *exact* control, because Adams' blade mechanism is always firm on its sturdy, one-piece, wishbone frame. What's more, blade always operates at constant speed — regardless of the number of controls in use.

Blade positioning is fast . . . goes from deep ditch-cut to high bank-cut in less than a minute . . . to other positions even faster. Moldboard turns 360° for quick changes from forward work, to reverse ditching and grading.

See Adams in action

Why not let us arrange for an Adams grader demonstration? See how a LeTourneau-Westinghouse grader can help *you* cut costs and increase production. 7 sizes — 60 to 190 hp. Choice of GM or Cummins engines on 6 larger models. 135 and 190 hp graders have torque-converter drive.

*Trademark G-1524-MQJ-1



Speedy 660 Adams grader cleans up around shovels —saves wear on haulers' tires and permits faster shovel operation. At the Copper Cities pit, 24,000 tons of rock and ore are mined per day.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



1958 officers of NCSA are: O. E. Benson, president (left); J. R. Callanan, treasurer (middle) and Warren C. Rowe, vice president (right)

NCSA meeting

continued from page 120

bers are urged to write Mr. Boyd if they are interested in joining the work of the active group; the greater the participation, the more helpful the program will be.

Members are better informed on matters pertaining to the crushed stone business because of improvement in Association communications and publications. About 40 letters have been sent out by the headquarters staff, covering many fields of interest to producers. An index of the Discussion of Operating Problems booklets, published annually since 1946, has been completed and mailed to members. Value of the index to members is evidenced by the increasing requests for it.

More interest in safety, particularly in NCSA's Safety Contest, is a goal of the Accident Prevention Program, headed by H. H. Kirwin. It is believed desirable, in an effort to increase interest, to simplify and consolidate some of the forms required by the U. S. Bureau of Mines. The committee is negotiating with the Bureau on that matter, and prospects for success are bright.

The Safety Committee is working on the problem of making more equitable the selection of contest winners. Also, in developing a more effective safety program, each member company has been asked to name a company man to handle safety matters for it with NCSA.

Membership in NCSA has grown since the February convention. Four new active members have been added to bring the current total to 158. Membership in the Manufacturers' Division now totals 125, an increase over last year. This increase is unusual, since history shows that membership in the Division grows mainly through additions during a show year.

Progress on a new legislative program was explained in detail by J. F. Lane, NCSA counsel. The new plan, previously approved by the Board, concerns proposed legislation that would affect the crushed stone industry. NCSA may decide to take a position on a proposed bill, or it may decide to maintain contact and report to membership. If a position is taken, a formal statement setting forth that position is submitted to the proper Congressional Committee.

So far, the program has been implemented actively. NCSA has taken a position on five subjects and has submitted formal statements outlining that position. Basing results on Congressional action at the time of this report, the Association's score is an excellent one.

Much action also has been taken on the second area—maintaining contact and reporting. Members have received reports on several proposed bills, allowing them to take action as they desired.

NCSA's engineering work is being carried forward on all fronts. J. E. Gray, engineering director, gave a complete report on all phases of this work and the progress being made in it. His report was supplemented by one from A. T. Goldbeck, engineering consultant.

The field engineer, Howard M. Bixby, spent about one-third of his time this past year in the field, working on technical problems and making calls on members and state highway departments.

Laboratory work of NCSA is divided into two classifications: (1) research and (2) service testing. For the six-month period prior to the meeting, 42 percent of laboratory-staff time was spent on research, the remainder on service testing. The major portion of research work has been divided among four projects: (1) investigation of fine graded portion of crushed stone base material, (2) soundness, (3) effect of maximum size of aggregate on the properties of concrete, and (4) investigation of stability of bituminous binder mixes as affected by maximum size of aggregate.

Service testing for members who request technical assistance is an important function of the engineering work. Mr. Gray reviewed the various

Please turn to page 156

Enter 1475 on Reader Card

Why pivot-steer hauler



cuts equipment downtime... boosts pit output... lowers handling costs...

Rugged, simplified construction is one big reason why speedy LeTourneau-Westinghouse Tournapull® Rear-Dumps keep working efficiently day after day... year after year... to help pit owners cut costs. Notice that on this machine there are no springs, no tie rods, no hose and pipe lines, no frame, no long drive-shaft to require maintenance and repair.

In place of a foundation frame and body sub-frame, Tournapull prime-mover and trail-unit are hitched together by means of a high horizontal yoke. Yoke pivots horizontally on kingpin at front... then extends back along side of bowl, where it pivots vertically just above and ahead of rear wheels. This unique vertical and horizontal kingpin arrangement also provides an easy oscillating action that eliminates most twisting, tilting strains ...permits higher working speeds on uneven ground to boost pit output.

Resists heaviest loading jolts

Shovel operator does not have to take it slow and easy when loading heavy materials. L-W Rear-Dump bowl is all steel — no wood fillers. Triple-layer floor is lined with heat-treated tool-steel strips, welded to solid billets laid over heavy steel plate. Sloping sides deflect load shock, quickly cushion floor area with layer of material to minimize rock damage.

Tire, clutch, transmission wear reduced

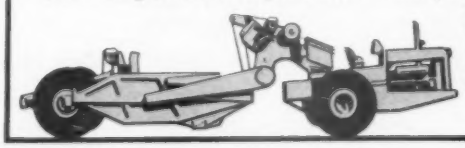
Costly wear on tires, clutch, and transmission caused by spinning wheels in slippery or loose footing, is minimized with Tournapull Rear-Dump. When either powered wheel begins to spin, unit's exclusive L-W power-transfer differential automatically diverts up to 80% of power to drive wheel on firmest footing. Also, electric 90° pivot-turn through geared kingpin, lets operator "walk" prime-mover out of mud or loose sand. Dumping action can also be used to "hump" empty hauler off a soft bank.

Features like these — plus full 90° turns, efficient electric-controls, fast, clean dump, giant air brakes, excellent visibility — add up to high production and low costs. Let us show you a LeTourneau-Westinghouse Tournapull Rear-Dump in action. Available in 3 sizes: 11, 22, and 35 tons.

R-1892-A

Bonus interchangeability feature

For less than ¼ the cost of an L-W Tournapull prime-mover with Rear-Dump, you can get an easy-loading L-W scraper to interchange with original Rear-Dump trail-unit. Change-over — using same 2-wheel prime-mover — takes just a few hours. Use scraper to lower dirtmoving costs on stripping operations, haul-road or drainage construction, and for exploratory mining. Other trail-units to increase prime-mover's usefulness also available.



LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

"With our TD-24 we are pushing 40-ton rock slabs —dozing and ripping at a 50% better rate than with our other big tractor," states Owner L. J. Luttjohann. He removes a 24-inch-thick hard rock stratum; rips and dozes-off a soft rock layer with his "24" to uncover high-grade limestone deposits.



How Planet Power-Steered TD-24 outproduces clutch-steered competitor by an amazing 50%

...stripping

for Luttjohann Stone Co.,



States Operator Alvin Hanson "This new TD-24 Torque Converter is great for my ego. The other dozer's operator works harder, but I move at least one-half more material per day than he will!"

Dozing 40-ton chunks of stone aside—ripping worthless rock layers into movable spoil—this Planet Power-steered TD-24 is outproducing its 20-ton steering-clutch-steered competitor, by the amazing margin of 50%!

Both crawlers are working under identical conditions. Both are ripping and stripping overburden for the Luttjohann Stone Co., near Topeka, Kansas.

The decisive difference is: the TD-24 has "live" power on both tracks all the



overburden!

Topeka, Kansas

time. Planet Power steering eliminates load-limiting "dead-track drag." You don't "half-kill" your power and traction to guide the TD-24—as you must with any king-sized steering-clutch tractor. You can even "equalize" TD-24 track speed to steer accurately with big offset loads!

Both king-sized crawlers cost approximately the same to buy and operate. But the TD-24 Torque-Converter does half-again as much as the other rig!

Prove to yourself what a tremendous profit-earning advantage the Planet Power-steered TD-24 gives you over anything else on tracks. Compare the huge capacity increase Planet Power steering delivers on benching, whether on turns or straightaway. Add up the extra 'dozing passes you get per day from exclusive Hi-Lo shifting—and from high TD-24 reverse speeds. Ask your International Construction Equipment Distributor for your demonstration!

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

A good supervisor plays an important role

How to solve grievance complaints

*By ROBLEY D. STEVENS**

EMPLOYERS IN THE ROCK products industry today should be looking for supervisors who have the qualities of leadership to maintain sound management-employe relations. Good leadership on the part of supervisors will go a long way to make it possible to handle and solve employe grievances.

A supervisor has to play a major role in management-employe relations. He has no other choice, since most of the employes report to him. They usually get their work orders, supervision, pay, materials, discipline and recognition from the supervisor. Most employes seldom come in contact with anyone above a supervisor or foreman. To the employes he IS the company.

Employes feel that what a supervisor or foreman says and does represents not only his attitude, but also the attitude of the company. If they like the way he runs his department, they usually like the company. If they don't like the way he does business, they may not like the company.

If a supervisor in your company is to keep his department operating at maximum efficiency, he should be alert to recognize the symptoms of grievances. He should try to analyze the causes of those symptoms, to prevent the grievances from developing into the serious effects of work stoppage or high personnel turnover.

The success of a supervisor in your company in getting out the work is often determined by the willingness of employes to do their jobs and eagerness to do them well. Dissatisfied employes cannot contribute their best efforts.

When an employe in your company is dissatisfied on the job because of some existing condition —fancied or real—or because some adverse action has been taken against him, he has a "grievance."

The term grievance has been most frequently associated with an employe's formal request for relief from something which he alleges is unfair. These disagreements between employes and their supervisors may require a formal hearing to resolve, with problems brought to the management by a representative of an organized employe group.

However, an effective supervisor in your company can solve many of the most common symptoms of grievances—horseplay on the job, disloyalty, insubordination, poor quality work, wastefulness, disciplinary actions and disregard for management prerogatives among the employes before they become formal grievances.

An employe's conduct may be his way of showing he has a grievance. He may show it unconsciously by reduced production, poor quality work, loafing on the job, excessive absenteeism, brooding or carrying a chip on his shoulder, insubordination and lack of cooperation.

The alert supervisor in your company watches for changes in his employe's customary work habits. When he detects those changes he suspects that something may be wrong. He is guided by the knowledge that if he neglects the little grievances, even though they may seem trivial, he is liable to be faced later with a more complex and more difficult situation.

The specific cause of one of the "little" grievances are often of less importance than the ways in which the grievances are handled. Employe grievances can be approached by any one or a combination of the following: Informal discussion with supervisors, formal grievance procedures, negotiations with employe organizations.

When an employe in your company seeks correction of some condition within the work environment, the person to whom he normally turns is his supervisor or foreman. It is the supervisor's prerogative (and part of his responsibility) to resolve the grievance. It is at this level of super-

Please turn to page 145

*Management Consultant

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Replaces power shovel with 4-In-1

...gets versatility unlimited!



Digging, 'dozing, clearing, loading—this International Drott TD-9 4-In-1 replaces the limited-duty performance of a ⅜ cu. yd. power shovel. Tony Pacifico Company, Charleston, W. Va., practically builds a 100-ton-per-hour stone-quarrying operation around 4-In-1 versatility. Above, using bulldozer action, the 4-In-1 is removing overburden from a 60-foot-thick rock stratum. Owner formerly had to hire a dozer in addition to the power shovel to clear and strip!



Using a back-drag motion of the clam lip, with high-reaching 4-In-1 clamshell action, the Pacificos do a fast, low-cost job of bank-sloping—to forestall earth slides into the quarry. The exclusive, big-capacity clamshell also gives speedy "stand-and-fill" action of loose materials.



Pushing over a hardwood sapling, the Pacifico 4-In-1 is used for land-clearing ahead of stripping quarry overburden. For uprooting larger trees, a grubber blade can replace the 4-In-1 bucket—to apply the tremendous lifting power of exclusive Drott pry-over-shoe break-out action!



Sticky clay dumps clean—quits gumming the works and slowing overburden removal when the Pacificos use 4-In-1 clamshell bottom dumping. Opening the clam pulls sticky materials from bucket surfaces—gravity pull does the rest, to give the 4-In-1 positive self clean-out!

Prove 4-In-1 four-machine versatility unlimited! Move the machine-selector lever — try the built-in *clamshell, "carry-type" scraper, bulldozer and Skid-Shovel* actions. Compare exclusive pry-over-shoe break-out action for digging hard materials other rigs can't budge! See how exclusive Hydro-Spring swallows shock, protects performance. Ask your International Drott Distributor for a 4-In-1 demonstration.

International Harvester Company, Chicago 1, Illinois
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Gentlemen:
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☐ 1-yd. TD-6 (CR-640-H) ☐ 1½-yd. TD-9 (CR-627-H) ☐ 2¼-yd. TD-14 (CR-635-H) ☐ 3-yd. TD-18 (CR-632-H)

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Here are some rules to follow

The care and maintenance of air compressors

*By EDMOND C. POWERS**

COMPRESSED AIR is widely used in the rock products field, but not all compressed-air systems are efficient. If a system is basically sound, good preventive maintenance can save money. However, some systems—especially old ones to which additions have been made due to increased needs—may require some corrective maintenance of the compressor and its associated equipment.

The air compressor and compressed-air system must be guarded against dust produced in plant operations. Both the incoming atmospheric air and the compressed air must be protected. So the first step in a corrective maintenance survey is an examination of dust control throughout the system, from the intake of atmospheric air at the compressor to final use at, say, an air-powered drill.

Dust is only one enemy of the compressor and system. Moisture is another. As air travels to the using equipment, it cools and moisture condenses in the system. Rust caused by this moisture flakes off and is blown into the tools, with inconvenient, often disastrous results.

Water vapor is always present to varying degrees in the atmosphere. Some form of filter or drainage must be provided at those points in the system where condensation tends to collect. If no such tendency exists, artificial means must be provided to collect the water.

Leaking joints in the piping are another major cause of inefficiency. Regular inspections, rate-of-flow meters and alarm or signal devices are all useful in detecting these leaks. Compressed air also may be wasted through misuse or carelessness, and the compressor itself may be in need of repair.

A frequently neglected part of a compressed-air system is the equipment associated with the operation of most compressors, such as filters, receivers and aftercoolers. Periodic checks of these items will help to insure optimum effectiveness of the whole system.

A survey of the compressed-air installation should be systematic, starting where the air is fed to the compressor, passing through the compres-

Please turn to page 130

**Educational Director, Compressed Air and Gas Institute*

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PAYHAULER FLEET

whips 17% grade with bonus loads

The Caldwell Engineers' five-unit 65 Payhauler® fleet highballs 2,500 cu yd of shot rock 1,000 feet daily up a haul road with 17% average grade. That's how this subcontractor keeps on schedule! His contract calls for excavating and crushing 165,000 tons of rock on the $13,000,000 hydro and flood control Oliver Dam under construction at Columbus, Ga.

Making the 17% grade with bonus loads is routine for the Payhauler fleet on this newest of all dams being built by the Georgia Power Co. at Columbus.



"These are crooked haul roads," reports excavation foreman Dudley Rabb, "but our Payhauler fleet is whipping them to keep us on schedule. The rigs haul through axle-deep water 50% of the time...make pull-outs up roads that rise 170 feet in 1,000 feet...yet speed bonus loads to crusher and stockpile."

Prove the get-away surge, and up to 25% faster haul speed of an International Payhauler—the result of bonus turbo-charged diesel power; road-matched and load-matched gear choice; and the power-cushioning leverage of planetary drive axles.

See how a Payhauler shortens the cycle with pick-up truck spotting ease. Discover how exclusive high reverse, zip-around power steering, and grade-beating power boost your profits. Try split-second dumping with the double-acting hydraulic hoist. Measure the advantage of Payhauler operating ease, and downgrade safety of positive Torqmatic braking! See your International Equipment Distributor for a demonstration!

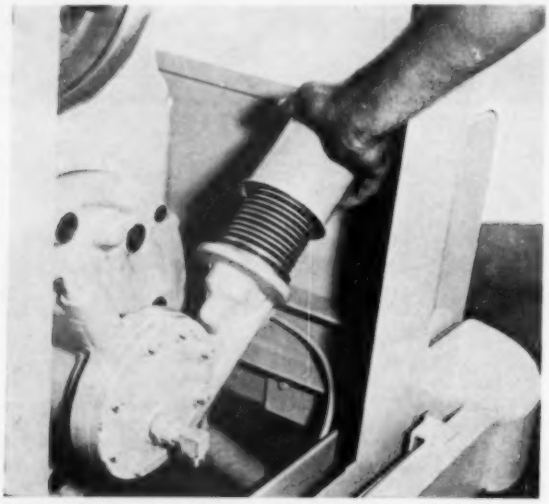
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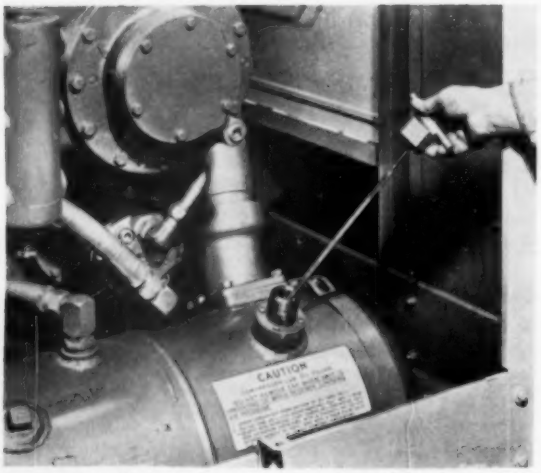
A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



Inspection at regular intervals is an important function of good preventive maintenance. Here, rotor vanes are being inspected



Periodically check and remove the oil filter cover for cleaning



Compressor oil supply is easily checked on the portable rotary with the combination dip stick-filler plug which is readily accessible through the rear gallery

Air compressor care

continued from page 128

sor plant and its associated equipment, following all piping and ending with an examination of the compressed air at points of use, including the workmanship of operators.

Corrective maintenance varies from the instruction of an operator in the proper use of an air-power tool to lubrication of the compressor. Preventive maintenance, on the other hand, is fairly uniform.

All mechanical devices need regular and effective maintenance, and air compressors are no exception. Three general rules sum up the care and maintenance of compressors: inspect at regular intervals, lubricate properly and follow recommended procedures.

Frequency of inspection is determined by the surroundings in which the machine operates. The best general rule is to follow the manufacturer's service manual, as amended by the user's experience and special conditions of operation.

Check lists and inspection records need not be elaborate, but they are valuable tools in starting and keeping a log of maintenance operations.

At the time of periodic inspections, necessary corrective action may be taken, including cleaning of air valves and crankcase. The presence of deposits on valves indicates that unsuitable (or too much) oil is being used or that intake air is not clean. All passages should be thoroughly clean of oil and carbon.

Compressor crankcases must be drained and refilled with clean oil at regular intervals. Before refilling, the crankcase should be thoroughly cleaned and, in aggravated cases, flushed with oil —never with gasoline or other flammable fluid. Water jackets should also be checked regularly and cleaned or scoured as local water conditions require.

Lack of adequate and properly timed lubrication will result in damage to many parts, and the choice of a poor grade of lubricant will result in shortened compressor life and decreased efficiency. Only a high-grade lubricant meeting the compressor manufacturer's specifications should be used, and it should be used as prescribed.

Compressors may require as many as three types of oil—one for bearings and crankcase, another for the compressor cylinder, and a third for power cylinders. Single-acting compressors require that the oil be suitable for both cylinder and crankcase lubrication (compressor-cylinder oil); double-acting units may use compressor-cylinder oil for cylinder lubrication and crankcase oil for

Please turn to page 133



This Model TD Rear Dump Euclid offers a 10-speed Fuller 10-F-1220 Transmission.



A 5-speed Fuller 5-F-1220 Transmission gives rugged dependability to this Euclid R-18 Rear Dump Truck.



This Euclid S-12 Hydraulic Scraper is powered through a 5-speed Fuller 5-F-1220 Transmission.

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For heavy-duty earthmoving and mining equipment, leading manufacturers standardize on Fuller Transmissions . . . for these good reasons:

Fuller Transmissions are designed and built for long, trouble-free service under the most severe operating conditions. These heavy-duty transmissions provide smoother shifting, longer engine life and the right gear ratios for the job . . . all performance features that add up to faster work cycles and greater profits for Fuller Transmission users.

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From more than 100 models available for rubber-tired equipment, you'll find a Fuller Transmission designed to do your job better . . . and at lower-than-ever operating cost.

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TRANSMISSIONS

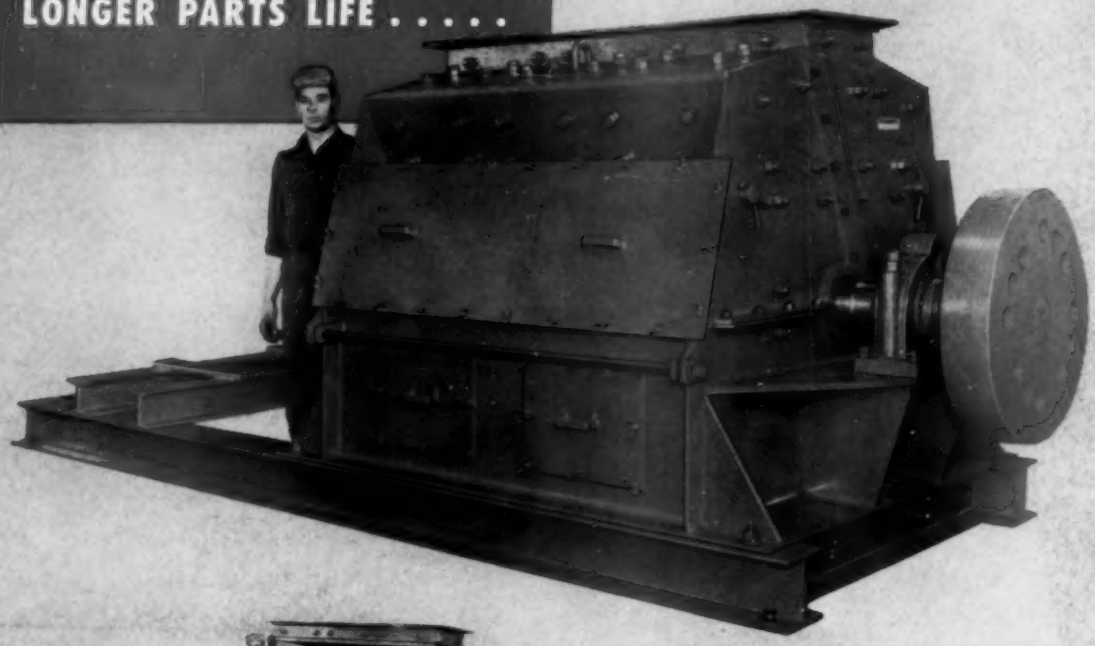
FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich. Subsidiary, Eaton Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

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NEW DUAL "2-POINT" ADJUSTMENT INSURES MORE UNIFORM GRINDING, LONGER PARTS LIFE . . . . .

WILLIAMS *Reversible* HAMMER MILLS





Williams Reversible Hammer Mill with cover open.
Note these features:

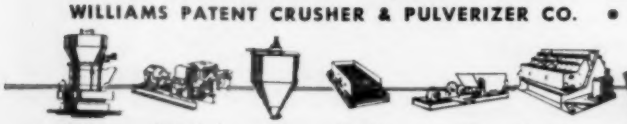
- Super-strong reinforced steel plate frame
- Renewable wear-resistant manganese steel liners
- Heavy duty oversize forged steel rotor shaft
- Anti-friction self-aligning roller bearings in dust-tight housings
- Complete accessibility to interior for quick parts changing

It's another Williams "first"—features not available in other hammer mills—that now makes it possible to maintain the original close clearances of *both* grinding plates *AND* cage sections against the rotating hammers. This easy-to-make "2-point" adjustment, in the most critical grinding area inside the hammer mill, gives absolute assurance of consistently uniform product quality.

In addition to the advantages of the Dual "2-Point" Adjustment, a Williams Reversible Hammer Mill substantially lowers upkeep expense by cutting hammer cost. Hammers can be operated in one direction today and another tomorrow simply by installing a simple reversing switch on the driving motor. Manual reversing of hammers no longer necessary. Grate bars also last longer. The double set of reversible manganese breaker plates, which last twice as long as other types, give four times the service! Maintenance and downtime are cut 50% or more.

Get all the facts about the hammer mill with *ALL* the top features.

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CRUSHERS • GRINDERS • SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

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Check clutch plates. Convenient hand holes are located on the sides of the clutch bell housing

Air compressor care

continued from page 130

frame running gear. While the compressor is in operation, lubricating oil must be tested to insure that it is clean, free from water and of the proper viscosity.

The manufacturer's installation, operation and maintenance instructions should be thoroughly read and understood by both operators and maintenance personnel. Since maintenance is tied to operation, preventive maintenance includes proper starting, operation and stopping of the unit, keeping it clean inside and out, and, if it is turbine-driven, insuring that steam is dry, neutral and free of carryover of water and boiler compound.

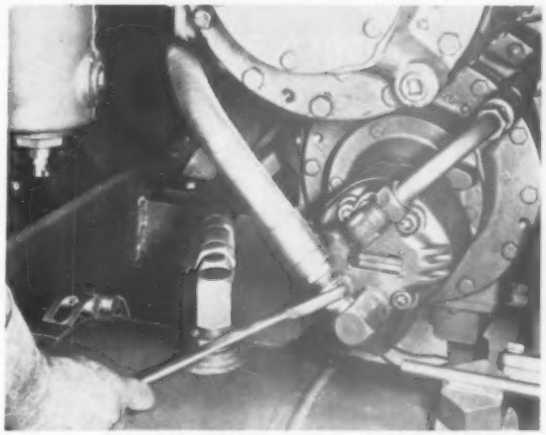
The extent to which spare parts are needed will depend on the value of "down" time and the degree of wear expected. Basic items which normally wear out, such as packing and bearing liners, should be on hand at all times.

The most likely places to look for leaks in the distribution system are around valves, hose connections, lines to tools and other operating media, drains, unions and other fittings.

Methods of checking include use of a hypodermic needle gauge inserted in the line at its operating end while the tool or other medium is in use, introduction of a pungent substance into the air system, brushing of soapy water on suspicious areas and the use of lighted candles or small torches.

In addition to pipes, the distribution system includes an air receiver, to absorb pulsations from

Please turn to page 158



To remove the oil pump on the portable rotary air compressor, first disconnect the intake and outlet lines with an ordinary wrench. Then only six bolts need be removed to take off the pump which is located on the high pressure cylinder. No other pipes or tanks need be removed

LOSS IN LINE PRESSURE FOR EACH OF THREE PIPE SIZES

Pipe size	Consumption (cfm.)	Loss in psi. per 1,000 ft.
2 in.	250	4.8
	500	19.2
3 in.	1,000	9.3
	1,500	21.0
4 in.	1,500	4.9
	2,000	8.8

HERE'S WHAT LEAKAGE COSTS YOU

Opening	1/16 in.	⅛ in.	¼ in.
Air lost*	182,000	740,000	2,921,000
Air cost in dollars**	13	52	204

* 100 psig. with nozzle coefficient of .65
** @ 7¢ per 1,000 cu. ft.

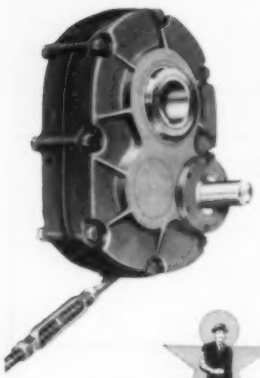


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QUALITY

IN TORQUE-ARM

...AMERICA'S MOST WIDELY USED SHAFT-MOUNTED SPEED REDUCER



Extreme ruggedness and top quality are built into every detail of the Dodge Torque-Arm Speed Reducer—from the specially heat treated helical steel gears to the corrosion resistant semisteel housing. Broad demand has made it necessary to add sizes until today Torque-Arm is America's most complete (and most widely used) line of shaft-mounted speed reducers. Capacities range from 1 to 100 hp; output speeds from 12 to 378 rpm.

Torque-Arm is mounted on the driven shaft, in any vertical or horizontal position. It is anchored by the torque-arm fastened to any fixed object. No need for foundation, flexible coupling, sliding base. No lining up difficulties. The unit is driven through any V-belt drive. Savings up to 1/3 are possible and Torque-Arm's efficiency is high. It delivers 97% efficiency in double reduction models; and almost 99% in single!

Ask you local Dodge Distributor—or write us for bulletin.

DODGE MANUFACTURING CORPORATION
2600 Union Street, Mishawaka, Indiana



CALL THE TRANSMISSIONEER
—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the white pages of your telephone directory for "Dodge Transmissioneer."

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DODGE
of Mishawaka, Ind.

Check load factors to improve your kiln performance

By H. H. WIGHT*

Editor's note: In this second of a series (see ROCK PRODUCTS, Feb. 1958, page 120) the author discusses the load factors which influence the placement and operation of the thrust rollers on a rotary kiln.



IF THE HELICAL TRAVEL just balances tire slide, the kiln will "float" between the thrust rollers, and pressure is, of course, zero. It is not difficult to so skew the support rollers that a kiln will "float" for four hours at a time.

If a roller weighing 6½ tons is clear of the lower thrust face it will be exerting a downhill pressure on the kiln of 510 lb., or .23 tons, from its own weight. If a roller axis is close to being parallel to the kiln axis, it may be pushing the kiln downhill slightly even though bearing against the lower thrust face. A roller thus lightly loaded (axial pressure) will be found to come away from the lower thrust face (float) whenever temperature conditions cause change in the length of the kiln shell.

A roller that has its correct share of axial loading will scarcely ever be found to float in this fashion. Conversely, drag across a surface can be reduced by deliberately diminishing skew, allowing float.

When a tire is machined, the end faces are surfaces of revolution so that if the tire axis were parallel to the kiln axis a dial indicator resting against an end face would show a constant reading. With the tire skew to the kiln, the indicator would show a sinusoidal fluctuation, the amplitude of which gives the weave of the tire. Actually, few tires remain this true to shape, but, mounting the indicator over a roller contact-line will eliminate errors due to radial variations.

Assuming that the fluctuation is sinusoidal, the axial velocity of a peripheral point is obtained at once. When tire diameter is 14 ft. 5 in., weave is .125 in., and time for one kiln revolution is 75 sec., the circumference of the sinusoidal circle is then .393 in. and maximum weave rate is .314 in. per minute.

This is much higher than the natural slide rate of tire past roller, for, since this is balanced by the above skew of 1.4 min., the slide must equal 36.2 x 12 divided by 2,840 or .15 in. per min., where 36.2 is the tire surface speed in ft. per min., and 2,840 is the helix ratio of axial travel to roll travel.

First consider the case wherein all rollers have equal skew and are set to just balance the natural

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*H. H. Wight, M.E., B.S., AMIE (Aust.), AFAIM, is chief engineer for Adelaide Cement Co., Ltd., Port Adelaide, South Australia

TABLE A

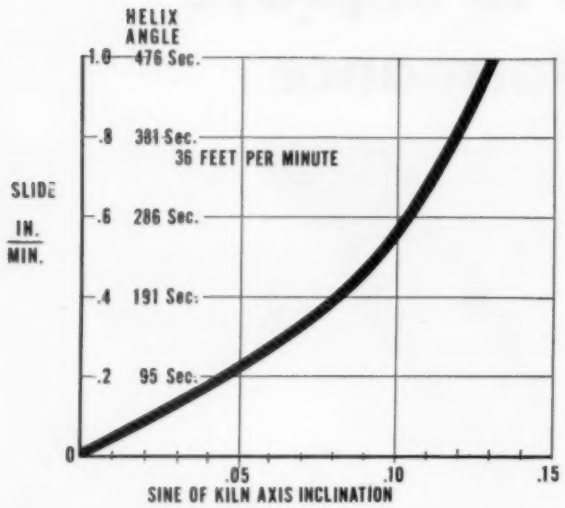
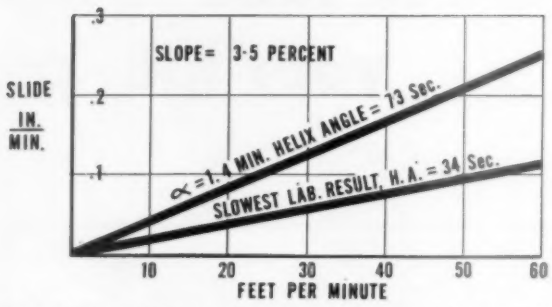


TABLE B



These drawings show that the axial thrust that will be exerted by a roller on a tire for a certain surface speed can be calculated from the helix angle, or rate of slide

Improving kiln performance

continued from page 135

slide of the tires. The thrust tire would then remain in a fixed position touching a thrust roller for about one-twentieth of a kiln revolution.

When a kiln is shut down, fluctuation of atmospheric temperature will cause it to move downhill by about 1/16 in. per day and thus to rest against the bottom thrust roller (BTR). Starting up, this roller will turn continuously but contact will soon be reduced until once again the tire touches for only a brief interval.

Now assume that all rollers are set with zero skew, and that the tire mounting and thrust roller assembly are rigid, and that the tire is against the BTR. Take the phase of the cycle when the tire is weaving towards BTR and has reached the point of maximum downhill weave; the kiln shell is then in the maximum uphill position. Further kiln rotation will tend to bring the tire away from the thrust roller, but the natural tire slide will ensure contact until the regression of tire weave is greater than tire slide.

This occurs after 30 deg. rotation. The tire then weaves free of BTR, passes its phase of maximum uphill weave and is returning when tire slide again brings it into contact with BTR. This occurs 39 deg. past the uphill maximum, and is thus after 219 deg. rotation. The BTR is then in contact for 171 deg., which is 47 percent of a revolution. For these conditions, if the tire were touching BTR for more than half a revolution the rollers would actually be skewed to push the kiln down against the thrust roller, that is, they would be assisting tire slide instead of balancing it. Maximum pressure will come on the thrust roller when tire weave is pushing the kiln uphill at the above .314 in. per min.

Loading on the thrust roller is not readily calculated, for, if all rollers were unable to slide axially in their bearings, and all tires had to slide over their rollers at this .31 rate, an axial thrust (or inclination) factor of .125 would be required, which, for a 1,200-ton kiln, means a thrust of 150 tons.

There is no point in considering individual roller skews and rates of tire slide, for it is the interaction of the algebraical sum of these two rates with the weave of the thrust tire that causes a kiln to contact the upper or lower thrust roller for a certain fraction of a kiln revolution. Pressure on a thrust roller cannot affect this fraction.

By choosing various amounts of roller skew, the complete range of contact with a thrust roller can be examined, and has been tabulated below, using the following conditions:

Tire Weave ..... 0.125 in.
Kiln Speed ..... 48 rph.
Tire Slide ..... 0.15 in. per min.

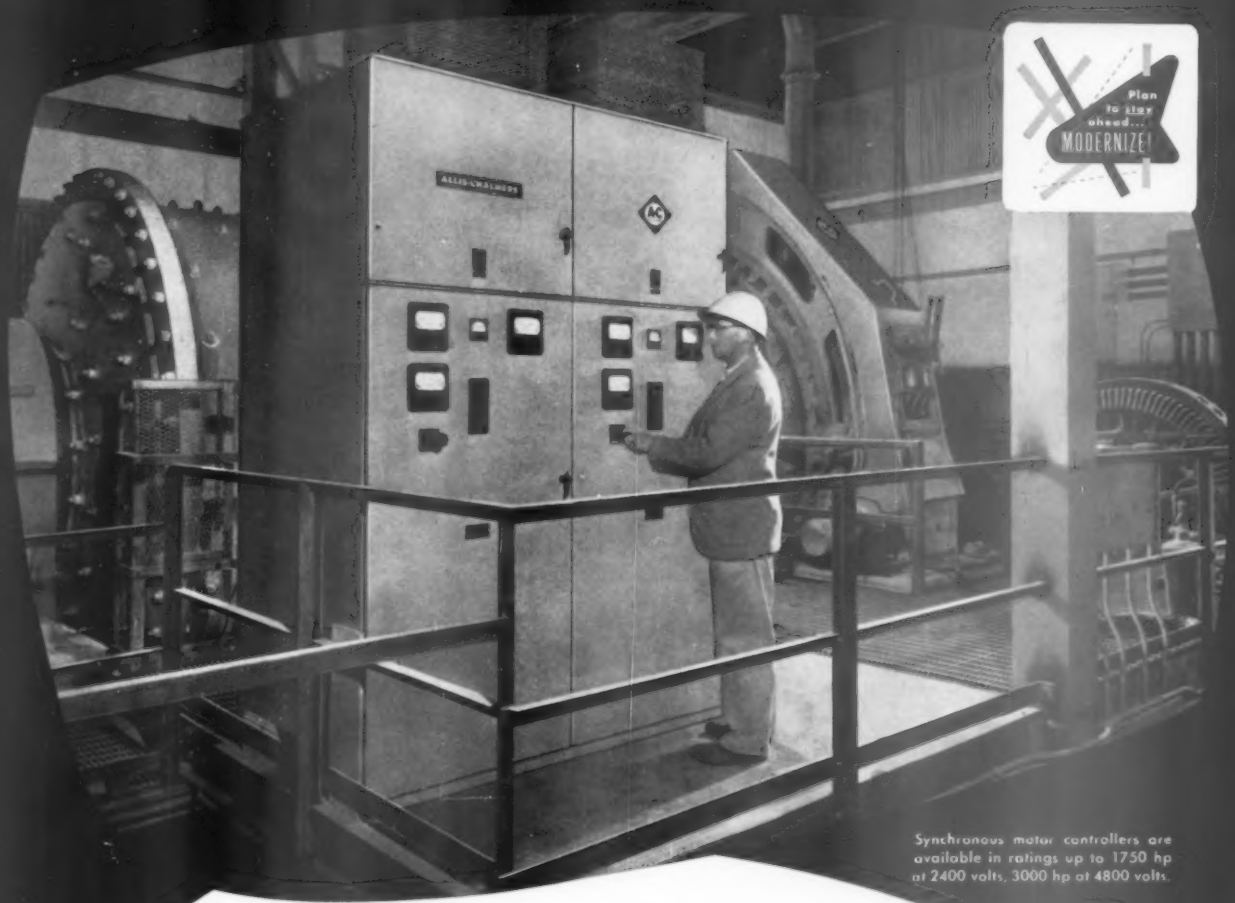
Tire 0 deg. position, when point of maximum downhill weave is at the bottom.

For example, if the kiln were touching the top thrust roller (the TTR) steadily for 90 deg., then moved to touch the BTR for 90 deg. during a rainstorm, net slide would have changed from .055 in. per min. up, to .055 down. Tire slide rate would therefore have increased from .15 to .26 in. per min.

In another example, if the kiln were steady on the TTR for 90 deg., what would be the contact if one of the seven assemblies were lubricated, thus completely removing the grip of these rollers?

Please turn to page 138

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Synchronous motor controllers are available in ratings up to 1750 hp at 2400 volts, 3000 hp at 4800 volts.

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- Automatic inching available for quick, accurate, convenient spotting.
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Case	Slide from Roller Helix In. per min.	Tire Slide	Net Slide	Thrust Start deg.	Roller End deg.	Contact Arc deg.
A.	.46 up	.15 down	.31 up	270	270	360
B.	.44 up	.15 down	.29 up	315	247	292
C.	.385 up	.15 down	.235 up	358	228	230
D.	.305 up	.15 down	.155 up	39	210	171
E.	.225 up	.15 down	.075 up	85	194	109
F.	.15 up	.15 down	0	TTR-180	360-BTR	0
G.	.075 up	.15 down	.075 down	265	14	109
H.	0	.15 down	.155 down	219	30	177
I.	.085 down	.15 down	.235 down	178	48	230
J.	.14 down	.15 down	.29 down	135	67	292
K.	.16 down	.15 down	.31 down	90	90	360

This table has been set out in graph B., and can be used to determine the alteration in the rate of slide under various conditions of weather or deliberate lubrication of surfaces

Improving kiln performance

continued from page 136

The inclined thrust is now to be carried by six tires, so the average axial thrust has increased from 6 tons to 7 tons, which is equivalent to increasing the slope of the kiln from 3.5 percent to 4.1 percent, and slide rate increases to 0.17 in. per min., (see graph A). So, net slide changes from the .055 up to .035 up, which corresponds to a contact on the TTR of 70 deg. (see graph B.)

Similarly, the slide rates for five remaining tires, then 4, 3 and 2, are .21, .26, .40 and .85 (see graph A). The corresponding contacts are: 5 tires, BTR for 20 deg.; 4 tires, BTR for 90 deg.; 3 tires—slide increases from .15 to .40, thus net slide becomes .195 down, which shows a BTR contact of 200 deg. (see graph B.)

Now consider the case where contact with the BTR occurs for a full kiln revolution, so that at the 90 deg. position, contact pressure is zero. (If support rollers are set to give an uphill wind of .15 in., tire slide rate must equal .15 + .31 or .46 in. per min.)

From 180 deg. to 270 deg. the tire has been pressing harder and harder against the BTR, and so the kiln has been pushed faster and faster uphill until the weave rate of .31 is reached.

The tires will have been pushed across their rollers at a faster rate until the .15 figure is reached, that is, the rollers will have been exerting less and less uphill thrust on the tires.

At the .15 mark, the rollers will be exerting no axial thrust on the kiln. Above this mark, the BTR will be attempting to drag all rollers uphill through their bearings, since the grip of tires on rollers is far in excess of the bearing resistance.

If the coefficient of a kiln bearing is .005, the coefficient for axial motion will be about .015. The weight to be moved is:

$$\frac{1{,}200}{\cos 30^\circ} + 14 \text{ rollers} = 1{,}477 \text{ tons},$$

thus axial resistance would be 22 tons.

With lubricated tire and roller surfaces this journal, axial resistance would be diminished, far above the .15 mark, as the weave of the thrust tire against BTR tends to push the kiln uphill, tires will be able to slide across their rollers, reducing the rate at which roller journals will need to slide through the bearings. At the very low rates of slide encountered in this problem, the axial resistance would certainly vary with the slide rate.

As the kiln shell is pushed uphill the teeth of the spur ring will have to slide across the pinion teeth. These teeth are rolling together, so once again the motion is a transverse slide, and here the frictional coefficient will certainly be high, probably not less than .5 with the viscous type of lubricant that is often used. Thus, about 12 tons must be added to the 22 tons.

A further amount of loading develops from shell contraction, such as would be caused by a sudden, cool change in the weather; a brief calculation shows a load on BTR of three tons, for a drop in shell average temperature of 50 deg. F.: At such a rate half the cooling occurs in five min. Changes in length of the lower half of shell are approximately double the changes of the upper half.

The total load on the BTR then consists of: 42 tons from inclination of kiln; 12 plus 22 from weave and skew, and 3 from contraction, for a total of 79 tons. A thrust roller should be designed for a loading that is double the simple inclined thrust.

When touching the TTR, tire weave forces the kiln downhill and all rollers are already against their thrust faces. But, kiln inclined load is here assisting the slide of the tires across the rollers,

Please turn to page 155

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Lima Type 1201 Shovel, owned by the Consumers Company of Chicago. Shown excavating limestone near McCook, Ill. The machine is equipped with a 32-ft. boom, 22-ft. dipper handle and 3½-cu. yd. dipper.

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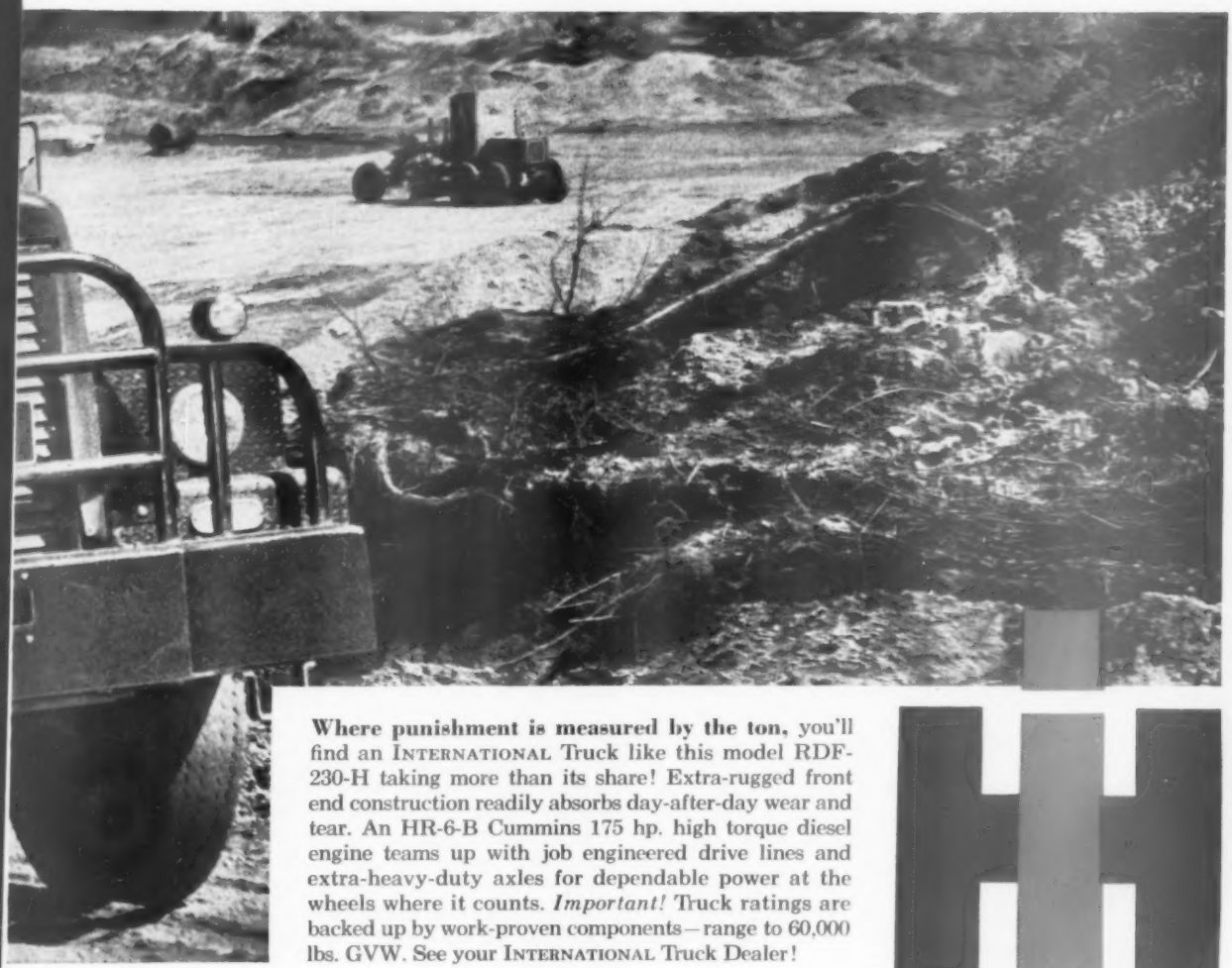
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Lake Ontario Cement

continued from page 84

Raw materials are elevated to air classifiers where minus 200 mesh is removed and oversize is dropped to the mill. Milled material is conveyed back to the boot of the bucket elevator to be recycled through the classifier. About 600 percent recirculating load is maintained in the system. Samples of the raw milled ingredients are taken just ahead of the two 120-tph. pumps which pump it through to one of the four 4,000-bbl. raw mix silos. Each silo is fitted with a quadrant blending system in the bottom to assure thorough mixing and blending of the fine, dry materials before they are pumped to the kiln feed silo, where they are further agitated by another quadrant blending system.

The kiln feed system keeps a flow of raw material constantly recirculating. A pneumatic conveyor feeds a constant head box which discharges to a constant volume feed box fitted with screw feeders, one for each kiln. Excess raw mix is taken from this compartment and taken back to the constant head box to be recirculated in the system.

Each of the two 11 x 375-ft. coal-fired kilns is fed by a bucket elevator discharging to a feed pipe through a feed-failure valve which signals the operator if the feed should stop. Dust from the bank of mechanical dust collectors and from the dust chamber on each kiln is brought to the boot of the feed elevator to be fed back into the kiln with the raw feed.

The kilns are coal fired with air blown from a classifier and coal mill. Coal is brought to storage hoppers over the mills with a 1,000-ft. belt conveyor system reclaiming from the coal storage area. This is the same system which brings gypsum rock from storage to the mill storage, but discharges to an inclined belt conveyor serving a 5,000-ton gypsum storage bin.

Hot clinker from each inclined grate cooler drops to an oscillating conveyor which carries it about 75 ft. to an inclined belt conveyor. To protect the belt from heat damage the last section of oscillating conveyor is fitted with water sprays to reduce clinker temperature below about 300 deg. F.

A vibrating screen scalps off oversize clinker and drops it to a gyratory crusher from which it is recycled back to the screen. Through-screen clinker is chuted to the clinker storage area where it is handled with the overhead crane, but it can be chuted to trucks for stockpiling.

Clinker grinding mills are fed in the same way as raw materials with weighing belt feeders for clinker and gypsum discharging to collecting belt conveyors. The conveyor for each two-compartment mill discharges to a bucket elevator to an air separator which removes minus 200 mesh materials. In this way sized particles are not sent through the finish grinding mills. Oversize from the classifier is dropped to the finish grinding mill and after grinding is recycled through the elevator to the classifier.

Finished cement is pumped either to the 20,000-bbl. capacity ship loading silos at the dock or to one of the four 15,000-bbl. plant storage silos. All storage silos are fitted with quadrant air agitation equipment to maintain a homogeneous mix. Cement from the plant silos is reclaimed for bagging or for bulk shipment by truck during the winter months and for local delivery; however, about 90 percent of the mill's production will be shipped by boat.

Boats are loaded quickly and efficiently by a

Please turn to page 145

MAJOR EQUIPMENT IN USE AT THE PICTON PLANT

Quarry and clay pit:	
Shovels, 5 cu. yd. electric	P & H, Harnischfeger Corp.
1½ cu. yd.	
Bulldozer, D7	Caterpillar Tractor Co.
Trucks (4) 22-ton rear dump	Euclid Div., GMC
Trucks (3) A160 rear dump	International Harvester Co.
Drill	Canadian Ingersoll-Rand Co.
Belt conveyor and stacker	Jeffrey Mfg. Co., Ltd.
Belt scales	The Canadian Fairbanks-Morse Co., Ltd.
Primary gyratory crusher, 48-in.	Kennedy-Van Saun Mfg. & Engr. Corp.
Screening and storage plant:	
Belt conveyors	Jeffrey Mfg. Co., Ltd.
Vibrating feeders (5) 4 x 6	
Belt scales	The Canadian Fairbanks-Morse Co., Ltd.
Vibrating screens (6) 5 x 12, (4)	The W. S. Tyler Co. of Canada, Ltd.
5 x 14, (2)	
Vibrating screens (8), 5 x 14	Thomas A. Dillon
Impact crushers (2), 36 x 48	Kennedy-Van Saun Mfg. & Engr. Corp.
Gyratory crusher 20-in.	
Gyratory crushers (2)	
Cement plant:	
Belt conveyors	Jeffrey Mfg. Co., Ltd.
Overhead cranes (2) 13- & 10-ton	Provincial Engineering, Ltd.
Clay dryer, 10 x 50	Kennedy-Van Saun Mfg. & Eng. Corp.
Raw material feeders (8)	Merrick Scale Mfg. Co.
Collector belts (2)	Link-Belt Ltd.
Raw mills (2) 11 x 20	Kennedy-Van Saun Mfg. & Eng. Corp.
Bucket elevators (5)	Jeffrey Mfg. Co., Ltd.
Pneumatic conveyor systems	Fuller Co.
Kilns (2) 11 x 375	Kennedy-Van Saun Mfg. & Eng. Corp.
Clinker coolers (2)	Fuller Co.
Clinker conveyor, 36 in. x 75 ft. oscillating	Link-Belt Ltd.
Clinker belt conveyors	Jeffrey Mfg. Co., Ltd.
Clinker screen	Thomas A. Dillon
Clinker crusher, gyratory	Kennedy-Van Saun Mfg. & Eng. Corp.
Clinker feeders (4)	Merrick Scale Mfg. Co.
Collector belts (2)	Link-Belt Ltd.
Finish mills (2)	Kennedy-Van Saun Mfg. & Eng. Corp.
Finish mill elevators (2)	Jeffrey Mfg. Co., Ltd.
Coal conveyor system	
Kiln dust collectors	Buell Engineering Co., Inc.
Ship loading system	Fuller Co.
Mills and silos dust collectors	The Northern Blower Co.
Engineers and architects	Burns & Roe of Michigan, Inc.
Construction	Johnson Drake & Piper, Inc. and H. J. McFarland Construction Co. Ltd. as Cement Plant Constructors



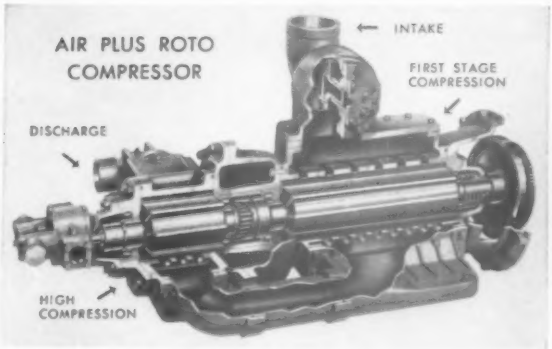
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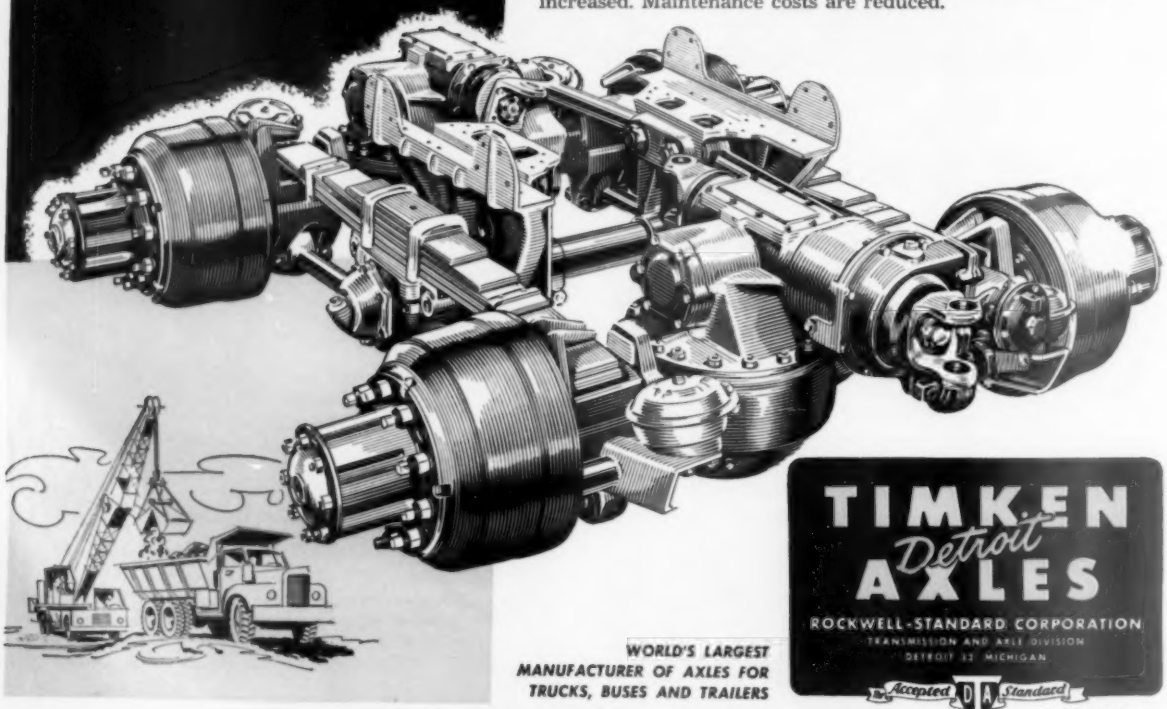
Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . *plus lower maintenance costs.*

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Lake Ontario Cement

continued from page 142

pneumatic conveyor system. The flow of cement from each silo is divided between two loading towers and each tower is equipped with two pneumatic loading spouts. These spouts are lowered into the hold of the bulk cement carrier. A 10,000-ton boat can be loaded in about 10 hours. While a number of modern lake boats are able to take on cement cargo, Canada Steamship Co., Ltd., is fitting out the **SS Glen El** to be a carrier for Lake Ontario's service.

Cement Plant Constructors, a joint venture of Johnson, Drake and Piper, Inc. and H. J. McFarland Construction Co. were responsible for the design and construction of this plant.

END

Grievance complaints

continued from page 126

vision that determination should be made of the justification for the grievance. Proper handling at this point will enhance supervisor-employe relationships on the job and contribute toward the feeling of mutual understanding and respect essential to a smooth-running company.

It is important for the supervisor to recognize that the employe's feeling, regardless of the seriousness of the problem, should dictate the amount of consideration to be given the grievance. A supervisor who gives an employe a brushoff or makes light of the grievance is adding fuel to the fire.

An employe who is determined to get the satisfaction he is seeking will carry his grievance on up the line. At each step, the condition complained of takes on a deeper meaning. If his aggravation is complicated by a feeling of resentment over a supervisor's rebuff, the problem becames a major issue.

There may be times when an employe feels that it would not be to his advantage to talk with his supervisor, when he would be justified in going to a higher level. When the grievance arrives at this stage, great skill and understanding must be exercised by the supervisor.

Research in personnel administration indicates that bypassing can be avoided. Bypassing can be overcome by the supervisor, through building a feeling of faith, confidence, and trust as a result of daily practices. He must be interested in the employes and sensitive to their attitudes, trying to understand the different personal characteristics of employes and their reactions to various pressures on the job. He must be careful how he talks and acts toward all his people, exercising patience, objectivity, and tolerance, even under the stress of fundamental disagreements.

A grievance requires careful analysis to get to the heart of the problem, to get to the bare facts as a basis for a suitable adjustment.

The understanding supervisor in your company should recognize that the problem brought by the employe is the most important thing in his mind at the moment. He must make it easy for the employe to tell his story and hear him out. It is not easy for a supervisor in your company who has to live with complaining employes to be wholly objective at all times. However, he should endeavor to keep the discussion centered on facts rather than on opinions which might cause argument.

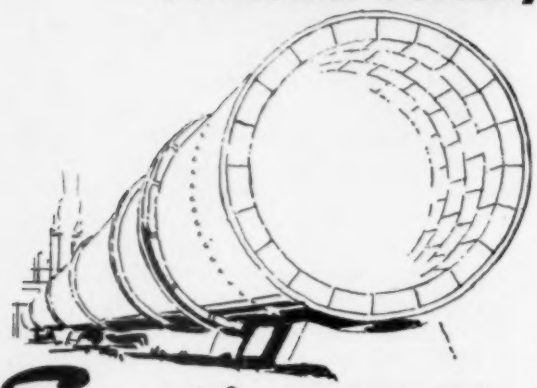
There will be times when discussion between employes and the best of supervisors will fail to resolve a problem. There also will be times when circumstances require that some adverse personnel action be taken against the employe. But whatever the solution, it should reach the heart of the problem by removing the cause of the grievance, and it should have minimum adverse effect upon other employes, on work operations, or on production.

Many more companies are beginning to recognize that improvements are needed to handle and resolve grievances. Improvements in your company can be made mainly through a better initial preparation of the case; a better conduct of hearing; and a more thorough preparation of the grievance report. However, the methods your company used a year ago may not be effective today due to changes occurring in your management-employe relationship.

END



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Power system requirements

continued from page 114

A load center substation (LCS) consisting of a transformer and low voltage switchgear (below 600 v.) in a complete unit has been found most economical. The LCS allows power to be transmitted at the primary distribution voltage from the main substation to a load area, where it is stepped down by the load center transformer to 480 v. The low voltage switchgear provides secondary distribution feeder circuits for the motors in the load area and a means of protecting the feeders against overloads and short circuits.

Unit substations of this type make it possible to supply power to a load which is concentrated in an area at the higher distribution voltage rather than at the lower voltage required in the area.

Using the higher voltage also makes it convenient to supply power to motors rated above 200 hp. at the voltage necessary to reduce the relative cost of these motors to a value less than would be found if 440 v. were used.

Load centers may vary in size from 112½ to 2,000 kva.; those rated at 750 and 1,000 kva. cost less per kva. than those of other ratings.

The cost is higher for load center substations below 750 kva. mainly because of the higher cost of load center transformers in these smaller ratings. Conversely, the cost is higher for unit substations above 1,000 kva. because of the higher cost of switchgear required for interrupting the higher available short circuit current for a secondary feeder fault.

This same high available short circuit current present when unit substations above 750 kva. are used also results in difficulty with the application of motor control centers, since this value will usually exceed their short circuit ratings. Control centers are used to centralize the control of motors within the plant and are connected to a secondary feeder from the load center substation. Exceeding the short circuit rating of these centers necessitates the application of a device to limit the short circuit current within the ratings of the motor control centers, raising the equipment cost.

It is important to keep voltage drops within the limits specified below. If voltage drops greater than these are present, a low-voltage condition may exist, resulting in an inefficient system operation.

Low voltage reduces the torque output of motors, a condition which is likely to give trouble when starting up (or even fail to accelerate machines to normal speed). It may also cause higher motor currents under running conditions, which may re-

Please turn to page 148

Two in One

Raymond Flash Drying *combines* DRYING *and* PULVERIZING in ONE integral Unit of Equipment

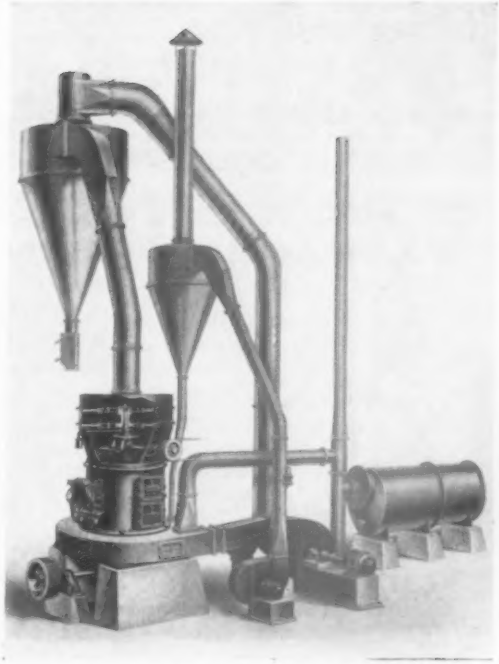
The urgent need for cost reduction makes Raymond Flash Drying equipment an important factor in the non-metallics industry. The Raymond system of *removing moisture while grinding* is the most direct method of producing finished materials in dry powdered form.

Flash drying may be applied to the Raymond Roller Mill, as shown, for pulverizing and drying limestone, gypsum, clays, phosphate rock and similar non-metallic minerals containing small percentages of surface moisture.

The fine particles are dispersed in, and carried by, a high velocity heated air stream. As a result, drying is practically instantaneous with high thermal efficiency. The finished material is closely controlled in dryness, fineness and temperature, insuring a quality product.

Advantages: Ease of installation to fit plant layout . . . unit equipment combines the functions often performed by several different units . . . automatic, dust-free operation . . . minimum attention with low-cost operation and maintenance.

Raymond Flash Drying has a wide range of applications, as it may be used with a Roller Mill, Imp Mill or Cage Mill, to suit the product handled. Write for further details and tell us your requirements.



Raymond Roller Mill with Flash Drying Accessories

COMBUSTION ENGINEERING, INC.

Raymond Division

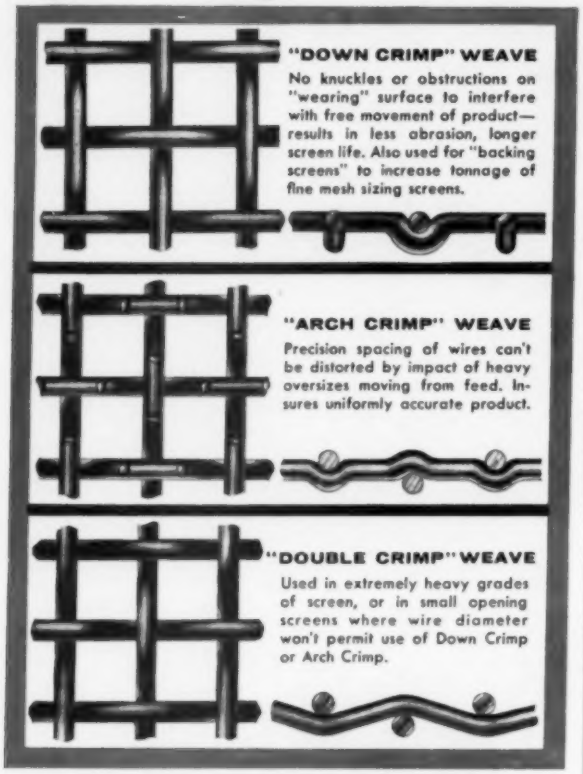
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SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

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These rugged weaves give longer service



STARSTEEL
HEAVY DUTY **SPACE SCREENS**

Match the screen to the job! That's one way to get more for every dollar. Write—describe your operation—and get the recommendations of experienced Star engineers.

But no matter how tough the job, if your screens are made of STARSTEEL they'll last up to twice as long. Extra care in weaving also promises Star Screen openings will stay accurate longer—precision-applied hook strips will fit machine frames better, install easier, will maintain tighter uniform tension for longer life. Order STARSTEEL —Take the gamble out of screen buying!

Most weaves and sizes ready to ship. **Ask for catalog.**

Star will produce screens or cloth from stainless or other steel alloys, Monel, brass, bronze, copper, aluminum or any metal that can be drawn into wire. Inquiries invited.

STAR WIRE SCREEN & IRON WORKS, INC.
2515 San Fernando Road • Los Angeles 65, Calif.

Subsidiary of Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.

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Power system requirements

continued from page 146

sult in high motor temperature and shorter electrical equipment life.

The high inrush current drawn from the power system when motors are being started may cause the voltage to drop an excessive amount when a low voltage condition exists. Such a condition causes starters of motors running on the line to drop open, stopping the motor, or may cause the starter contactor to chatter, reducing its life.

Low voltage problems may be rectified by the proper selection of cable sizes for the voltage and load which will be carried by a feeder. It may also be necessary in some plants to apply reduced voltage starters for motors to limit the high inrush of current on starting, thus reducing the voltage drop present.

The voltage rating on the secondary of a load center transformer is 480 v. for a 440-v. system, while the primary distribution voltage is 2,400 v. or 4,160 v. for systems on which motors and motor controllers rated 2,300 and 4,000 v. are applied.

If the load center transformer secondary is rated 480 v. and a 10-v. variation in the supply is assumed, the voltage that will appear on the secondary of the transformer will be 470 v. at no load. When load is applied to the substation, a 15-v. drop may be expected in the transformer secondary due to the impedance of the transformer. Other voltage drops may consist of a 10-v. drop on the secondary feeder and a 5-v. drop on a branch circuit feeder. The difference in these voltage drops and 480 v. would be 440 v., which would appear at the load. This same type of example could be used to explain the difference in the higher voltage ratings discussed previously.

END

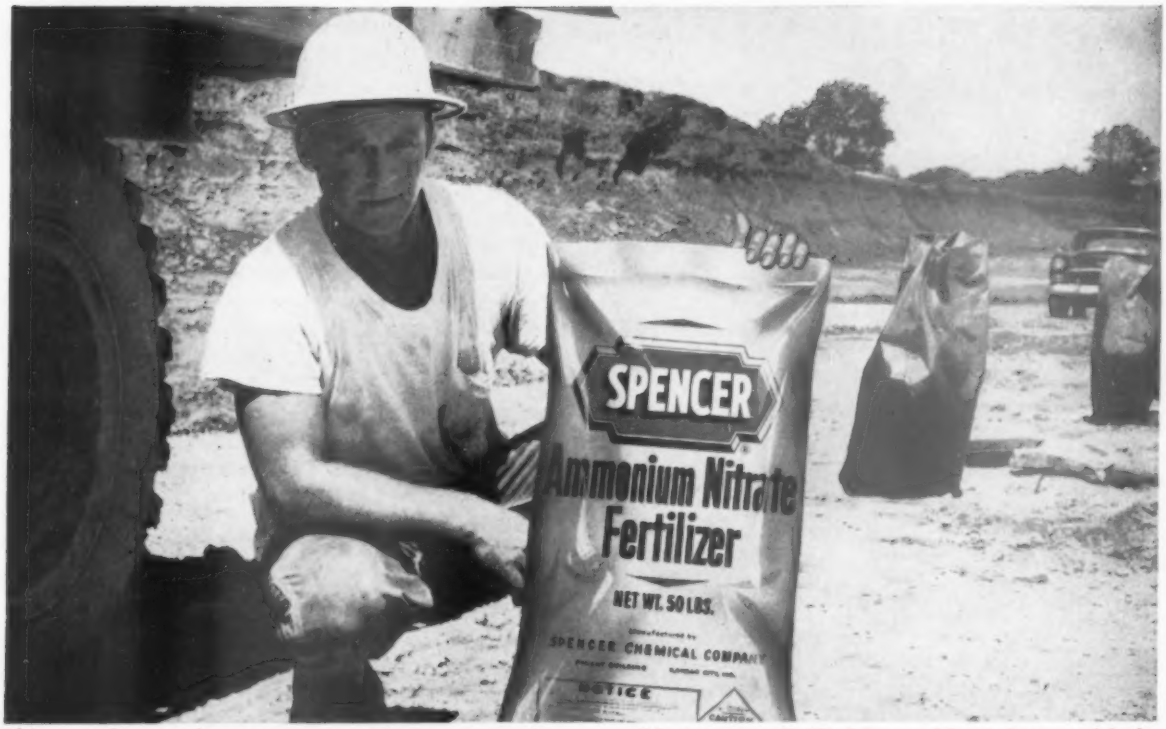
Jet flame

continued from page 85

In addition to the increased speeds of penetration, the jet-flame process makes it possible to "chamber" blast holes. Chambering consists of enlarging the blast hole at any desired depth so that extra explosive charges can be placed exactly where needed. The operator simply lifts the blowpipe off the bottom of the hole and lets the jet blast away. This induces more spalling at the desired spot and produces a bottle-shaped cavity, capable of holding a larger explosive charge.

The "Jet-Piercing" process, as this is known, was developed by the Linde Co. The Bucyrus-Erie Co. cooperated with Linde in the development of the drill rig.

END



This new Spencer improvement — shipping ammonium nitrate in sturdy polyethylene bags — now makes it possible to store oil filled bags without danger of leakage. Bags can even be stored out in the open for days!

Now! Ammonium Nitrate In Plastic Bags:

Revolutionary new polyethylene bags for Spencer Ammonium Nitrate end nuisance of leaking oil, slippery bags . . . help solve storage problems because they can be stacked outdoors.

Better than ever is the ammonium nitrate blasting process, pioneered four years ago by Spencer Chemical Company. That's because Spencer now offers you ammonium nitrate in heavy-duty *polyethylene* bags!

This new Spencer exclusive means that Spencer Ammonium Nitrate is easier to handle, easier to store.

Greater cleanliness is the first advantage these new bags offer. In the field it is common practice to add oil directly to the nitrate in the bag and then store it. This allows oil to soak into the nitrate and gives better results.

With paper bags, leakage often results. Bags get oily and soiled, making them hard to handle, and they have to be kept upright. With polyethylene bags, you can add oil through a small opening at the top of the bag and then seal it up with tape! You can then stack bags in the normal manner without fear of leakage. Oil soaks into the mix, not into trucks or storehouse.

And unlike paper bags, waterproof polyethylene bags can be left in the open field—even during rainstorms! No need even to cover them up. And because they *can* be left in the open field, Spencer Ammonium Nitrate bags can solve critical problems of storage space.

Besides these exclusive bags, Spencer offers you free advice and service, giving you the full benefits of the knowledge and experience gained from its pioneer work in this field. Spencer's special bulletin, "Cut Blasting Costs with Spencer Prilled Ammonium Nitrate," is yours for the asking. Mail coupon today!

SPENCER

MAIL THIS COUPON:

Spencer Chemical Company
Sales Supervisor,
Industrial Ammonium Nitrate
405 Dwight Building
Kansas City 5, Missouri

☐ Please send me free Spencer bulletin, "Cut Your Blasting Costs with Spencer Prilled Ammonium Nitrate."

☐ Please have a Spencer Technical Service Representative call—without cost or obligation to me.

Name_____

Company_____

Address_____

Post Office_____ State_____

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Sand from dolomite

continued from page 97

2 x ¾, 1¼ x 0, ⅜ x No. 8 and ½ x ¼-in. stone. Concrete products producers demand a sand about ¼ in. x 0, which is manufactured from a ¾ x ¼-in. fraction. Other sand users prefer to have the minus 200-mesh taken out, and this is sold for agricultural limestone.

The primary screen is a 4 x 12-ft. unit whose top deck scalps off oversize rock and drops it to a small surge hopper over a 4-ft. gyratory crusher. The maximum size of production stone can be set by changing the top deck of this screen.

This gyratory is fed by a small vibrating feeder that draws stone from the surge hopper. With the flow of stone controlled in this way, the crusher operates continuously and smoothly at full capacity. Crushed stone is conveyed out from the crusher to a point above the primary stone belt, where it can be recycled to the scalping screen, carried on to a secondary crusher or split between them in any proportion. This is done with a manually-controlled splitter plate in the hopper of a bifurcated chute at the transfer point.

The second vibrating screen is fed by an inclined belt conveyor that parallels the raw stone conveyor. It is a 4 x 10-ft. screen placed side by side with the scalping screen on top of the storage bins. By changing screen cloths it can make the same products as the primary screen or a group of smaller products. Oversize stone from this screen is dropped to a surge hopper of the same size and design as the one supplying the first gyratory crusher.

Oversize, usually plus 1¼-in. material, is fed to this 4-ft. shorthead crusher by a vibrating feeder. Crushed stone is delivered to the same inclined belt conveyor that serves the primary gyratory crusher and recycled in the system.

Nine storage compartments, each with a capacity of about 100 tons, hold stone ready for truck shipment. Three trucks may be loaded at one time, or material from any of the storage bins can be taken to a reserve storage that supplies the sand plant.

Sand plant. A concrete stave silo holds about 200 tons, enough to keep the sand plant operating about a day and a half. While any size stone can be drawn out to make sand, ¾ x ¼-in. is usually the most available size. After stone is withdrawn from the silo, it passes over the third vibrating screen in the storage tower, a 4 x 10-ft. unit.

Oversize fractions can be returned to storage in one of the nine bins. In this way, the fines screen

Please turn to page 155



when the stone comes tumbling down...

HENDRICK PERFORATED PLATE STANDS UP!

Hendrick H Quality Steel Plate stands up under the toughest, heavy-duty screening of crushed stone. It's made from high carbon or stainless steels. High carbon can be heat-treated after perforation for longer life. It screens faster and easier, while full openings eliminate blinding. Product uniformity is assured throughout the life of the screen. Deck changes are quick, for lowered labor costs.

Hendrick H Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape, and with perforations of any size.

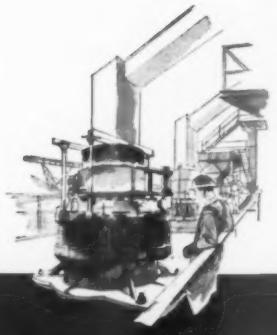
HENDRICK MANUFACTURING COMPANY
47 Dundaff Street Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

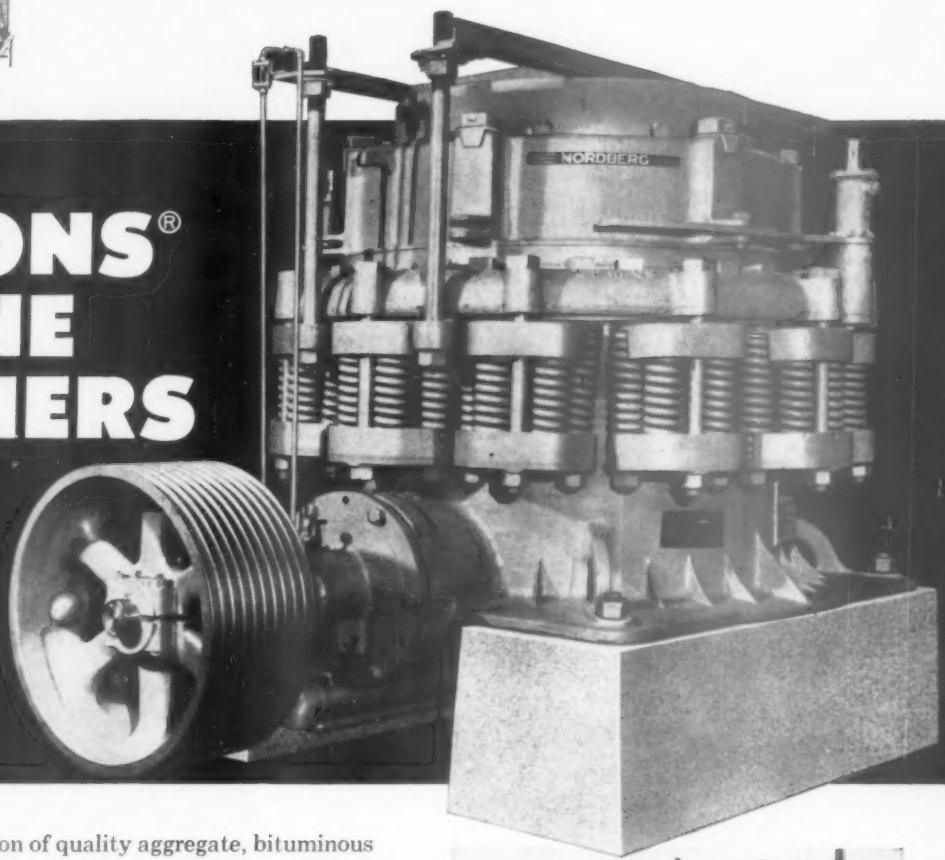
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You get Quality Aggregate at lower cost with...

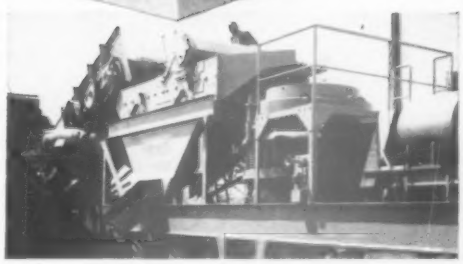


SYMONS® CONE CRUSHERS



For continuous production of quality aggregate, bituminous mixes and sand at lower cost—think first of Symons Cone Crushers—heavy duty, versatile crushers that produce more material to desired specifications, use less power, and give long service with low maintenance. Good reasons why these Nordberg built crushers are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Cone Crushers for both stationary and portable service. Write for descriptive data on Symons Cone Crushers—built in sizes to produce from 6 to 900 or more tons per hour.



IN PORTABLE SERVICE

Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids portable crushing plant utilizing a 4′ Symons Cone Crusher, shown above.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

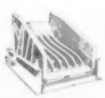
NORDBERG

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C-358



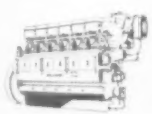
SYMONS GYRATORY CRUSHERS



SYMONS VIBRATING GRIZZLIES



SYMONS VIBRATING SCREENS



NORDBERG ENGINES

NORDBERG MACHINERY

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D. F.

Why cost conscious engineers specify

Research-Cottrell

Model Studies

One of the biggest problems in getting the most out of precipitators has been proper gas distribution at the precipitator inlet. Until recently this has been largely a matter of educated guessing.

Now, by using three dimensional, transparent scale models, Research-Cottrell has taken the "guesswork" out of engineering gas handling systems. Both major and minor design changes are made inexpensively on these scale models and the effects on gas flow studied. Correlation between models and full scale installations has proven the reliability of Research-Cottrell's new pre-installation techniques.

Briefly, here are the advantages of Research-Cottrell's gas flow model studies:

- Higher collection efficiency—when gas distribution at the inlet is more uniform, collection efficiency is higher.
- Smaller precipitator—for a given collection efficiency, precipitator size can be reduced by improving gas distribution at the inlet.
- Less pressure drop—by minimizing turbulence through improved flue design, pressure drop has been reduced by more than 40% in some cases.
- Less space needed—simplified flue arrangements and smaller precipitators can mean substantial savings in space.



This new service is available under three broad plans:

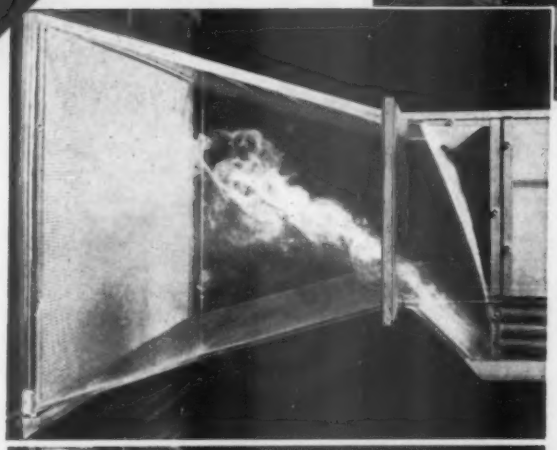
1. As part of a precipitator contract. 2. A study completely independent of a precipitator contract. 3. For any industrial gas distribution problem where these techniques will be beneficial.

For more details on this new service write for Bulletin 1.

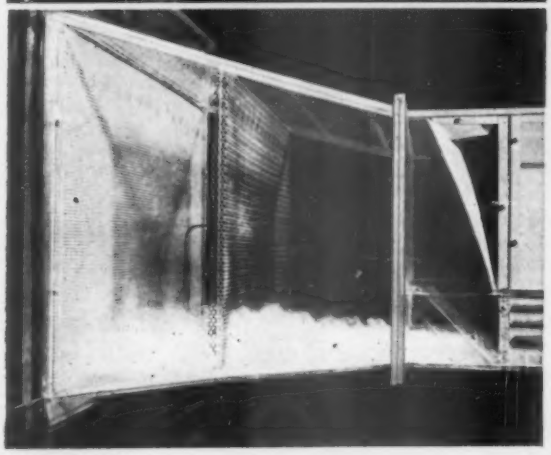
RC 186



↑ Research-Cottrell engineers studying the results of a change in flue design. This is a scale pre-installation model of a precipitator which handles 1.4 million cfm.



← The original flue design between air heater (right) and Cottrell precipitator (left) resulted in a turbulent, uneven pattern. Note the space between gas flow and bottom of flue and precipitator inlet.



← After sharp angle of flue was eliminated and perforated plate correctly positioned in flue, turbulence was minimized and gas flow hugs the floor.



A velocity traverse is being made across precipitator plates. This is part of a study on the effect of variations in positions of perforated plates in the gas handling system.

Research-Cottrell

RESEARCH-COTTRELL, INC. Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y. • Grant Building, Pittsburgh 19, Pa. • 228 N. La Salle St., Chicago 1, Ill. • 58 Sutter Street, San Francisco 4, Calif. • Research-Cottrell (Canada) Ltd., 33 Bloor Street East, Toronto 5, Ontario.

"Not merely to sell; but to serve . . . not only to make good steel products; but to make them still better . . . not only to fulfill today's requirements; but to anticipate tomorrow's—these are the principles that constantly guide CF&I."

G. F. Franz
President

Grinding Mill Bulletin #2

This ad is directed to those grinding mill operators who are interested in increasing the efficiency and production capacity of their ball mills. It is presented by CF&I—in line with our policy "*not merely to sell; but to serve*"—in the hopes that it will add some new information on grinding procedures.

First Things First—Determine Best One Size Ball Makeup Charge

In the first article of this series, it was shown that determining the optimum size assortment of grinding balls for a makeup charge is a practical means of improving mill operation. Before an attempt is made, however, to work out a ration makeup charge, the best makeup charge of one size ball should be established.

Factors Determining Correct Ball Size Choice

Ball . . . 1) Specific Gravity (affected by voids in the ball); . . . 2) Shape; . . . 3) Homogeneity; . . . 4) Relative Cost of balls by diameter

Mill . . . 1) Inside Diameter; . . . 2) Speed (peripheral speed rather than percent of critical speed)

Manner of Operation (assuming one-stage grinding only) . . . 1) Open or Closed Circuit (percent circulating load of closed circuit); . . . 2) Mill Pulp Density (specific gravity of pulp constituents)

Feed Material . . . 1) Size Structure of Mill Feed; . . . 2) Desired Particle Reduction; . . . 3) Character of Ore, i.e. (a) Specific gravity of gangue and of mineral or minerals, and (b) Grindability characteristics (comminution to crystal sizes; comminution through crystal sizes; sliming characteristics)

Ball Makeup Charge of One Size, for a New Mill

Use all the tools at hand to determine the best one size ball makeup charge: laboratory tests of feed material, mathematical formulae, and recommendations from ball mill and grinding ball manufacturers. One's own experience, of course, is invaluable. Full confidence cannot be placed in mathematical formulae for they may not accurately take into account all the factors affecting the not-fully-understood, complex mechanics of ball mill grinding. Tests made with laboratory-size equipment can indicate grindability of ore, but such scale-size work has its limitations in that the ratio between mill diameter, mill peripheral speed, ball diameter and particle size obtained in laboratory is not the ratio that exists in the full-scale operation.

Character of Ore—So IMPORTANT!

When a new mining property is being developed, the ore body is often not accessible; so that sampling will not indicate all the types of ore that will eventually be encountered. It is important that the comminution problem of the various ores to be encountered be studied in terms of the subsequent metallurgical processes, both physical and chemical. The degree to which the ores will be blended before entering the ball mill should be taken into consideration.

If no blending or poor blending is anticipated, the most difficult grinding ore should be given the most weight in determining ball size, although this size may be too large for the softer ores.

Effect of Ball Size

Either too large or too small a ball size addition will result in decreased mill throughput and increased power consumption per ton of ore ground for ball mill operations in closed circuit. Under-size balls haven't the impact to break the larger particles effectively, adversely affecting subsequent mineral liberation. Over-size grinding ball addition results in the seasoned charge of fewer balls offering less surface for attrition grinding, thus giving too coarse a grind for efficient mineral liberation. The optimum one size ball addition is a "happy medium" between these two conditions.

The penalty for the use of too small a size ball addition is generally considered greater than for using too large a size ball, so the tendency is to favor the larger size.

CF&I grinding balls are available in diameters from $3/4$" to 5", and are forged from special analysis steel. They are carefully inspected throughout production and immediately before shipment to make certain they have no surface pits, circumferential ridges or other surface unevenness. They are specified by many leading mill operators. Your nearest CF&I sales representative will be glad to give you complete details.

Indications of wrong size balls used in makeup charge in an operating mill will be discussed in the next article in this series on ball rationing.

For a reprint of the article on which this ad is based, please write on your company letterhead to: Mining Supply Department, The Colorado Fuel and Iron Corporation, P. O. Box 1920, Denver, Colorado.

OTHER CF&I STEEL PRODUCTS FOR THE CEMENT INDUSTRY

CF&I Grinding Rods • CF&I Grader Blades • CF&I Industrial Screens
CF&I Mine Rail and Accessories • Wickwire Rope • CF&I Rock Bolts

FORGED STEEL GRINDING BALLS
THE COLORADO FUEL AND IRON CORPORATION

5823-A

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston
Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix • Portland
Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

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Sand from dolomite

continued from page 150

adds to the flexibility of the plant by permitting continuous rescreening to obtain odd sizes, precision specifications or to make more stone of a given size when it is needed quickly. The screen drops most oversize into a small surge hopper fitted with a vibrating feeder above a 3-ft. shorthead crusher, but the crusher can be fed directly from storage from one bin which has a gate and feeder over the crusher.

MAJOR EQUIPMENT USED BY LAMBERT BROS.

Wagon drills	Gardner-Denver Co.
Shovel, 2½ cu. yd.	Northwest Engineering Co.
Trucks, end-dump (3)	Euclid Div., GMC (1); Mack Trucks, Inc. (2)
Primary crusher, 30 x 42-in.	Lippman Engineering Works
Vibrating screens (3)	Pioneer Engineering (2); W. S. Tyler Co. (1)
Apron feeder, 42-in. x 10-ft.	Smith Engineering Works
Gyratory crusher, 48 S.	Smith Engineering Works
Gyratory crushers, 4-ft. and 3-ft. shorthead	Nordberg Mfg. Co.
Vibrating feeders (4)	Syntron Co. (2); Jeffrey Mfg. Co. (2)
Concrete stave silo, 12 x 40-ft.	Memphis Concrete Co.
Air separator, 12-ft.	Williams Patent Crusher & Pulverizer Co.
Dust collectors (2)	Williams Patent Crusher & Pulverizer Co.
Belt conveyors	Lambert Bros. Div., Vulcan Materials Co.
Plant layout, fabrication and erection	Lambert Bros. Div., Vulcan Materials Co.
Belt scale	Merrick Scale Mfg. Co.
Truck scale	Fairbanks, Morse & Co.

Crushed material is recycled to the screen belt conveyor until it has been reduced to minus ¼-in. sand and can be conveyed to an air separator. This 16-ft. unit takes out minus 200-mesh fines. The larger size is delivered to an 8-ft. diam. sand storage tank, and the fines to another 8-ft. diam. tank for shipment by truck. The final screen, fine storage bins and crusher are vented to a pair of cyclone dust collectors, which strip out much of the dust generated in the area. END

Check load factors

continued from page 138

instead of opposing it. Similarly, if the support rollers are carried by roller bearings, end float must be provided for in the design. Thus it is preferable to accommodate the weave of the thrust tire by designing the thrust roller assembly so that it could oscillate not less than ¼ in. All this assumes that the thrust assemblies are rigid; elastic deformation would reduce the effect of tire weave.

The third and concluding section of this series will deal with the design and installation details of the tires themselves which influence their performance under operating conditions. END

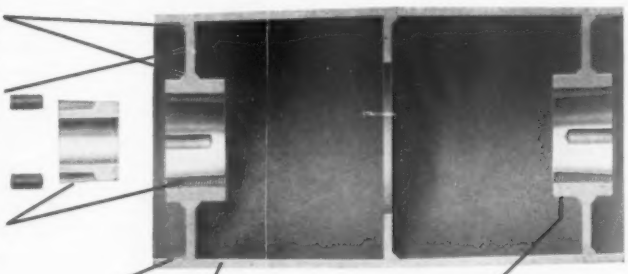
How LINK-BELT welded steel pulleys extend belt conveyor life

SUBMERGED ARC WELDS connecting rims and hubs to end discs are as strong as joined members.

END DISCS are machined for true concentricity. Welds provide fully enclosed assembly.

TAPER LOCK BUSHINGS assure full-compression grip — even on inaccurately finished shafts.

MINIMUM RIM OVERHANG prevents dirt buildup. Smooth pulley surfaces protect belt.



PURE RUBBER LAGGING is vulcanized to pulley for life. Choice of plain or herringbone.

MINIMUM OVERHUNG LOAD is assured. Bearings can be positioned close to hubs.

Taper lock bushings speed installation

Longer conveyor belt life depends on smooth-rolling, smooth-surface pulleys. Link-Belt welded steel pulleys with taper lock bushings meet these exacting requirements — drive the belt without slip, in a straight path with regulated tension. In addition, taper lock bushings simplify mounting.

Diameters: 6 to 60 in.; faces: 12 to 66 in.; for 15/16 to 10-in. shafts. See your Link-Belt factory branch store or authorized stock-carrying distributors.

EASY ON ◄ ► **EASY OFF**



Insert bushing in hub, align holes and keyseat, slide shaft into place.

Insert and tighten screws in holes which are threaded in hub half.

LINK-BELT

WELDED STEEL CONVEYOR PULLEYS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.283



Remove screws, screw one into half-thread hole in bushing.

With bushing released, shaft can easily be slipped off pulley.

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NCSA meeting

continued from page 122

types of problems that have been worked upon recently.

Cost accounting has received much attention recently, and a major contribution to NCSA's work on the subject for the past two years has been made by Arthur Goff, president of Wallace Stone Co., and his Cost Accounting Committee. Cost accounting procedure has changed with the industry, and the Board recognized the need for a change in the manual previously published by NCSA. Mr. Goff and his committee have put in long hours of hard work on this manual, and the important contribution was duly recognized by the Board at the meeting. A new manual will be published, containing typical report forms that are used by members to advantage in modern business operation.

Meeting of the executive committee, Manufacturers Division, NCSA also was held on the first morning of the two-day meet. L. A. Eiben, chairman of the Division, presided. A feature this year was the welcome presence of a half-dozen past chairmen of the Division.

A full report on the exposition held in Chicago this past February was given.

An important revelation is the fact that membership in the Division has grown since the last exposition. Apparently, desirability of membership has grown beyond the desire to join the Division for just the biennial show.

Mr. Eiben introduced NCSA President O. E. Benson and Vice President Warren C. Rowe. He also presented Mr. Lane, NCSA counsel, who reported on the legislative situation in Washington.

A little humor was injected at the end of the meeting when Wayne W. King presented to Mr. Eiben a number of "personal" items supposedly connected with "Black Bart" of old Western fame. The items had been collected by Walter B. Lenhart, ROCK PRODUCTS' Western Editor, and forwarded to Mr. King to show at the meeting.

Next meeting of the Board will be held January 26, 1959, in connection with the NCSA annual meeting (Jan. 27-30, 1959) at the Americana Hotel, Miami Beach, Fla. The Board discussed plans for the January meeting, and prospects are excellent for a most informative and worthwhile convention. The next mid-year meeting of the Board will be held in July, 1959, at The Homestead, Hot Springs, Va.

END



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Western Aggregates, Amarillo, Texas, hauls extra-size payloads with this husky high-capacity Autocar AP-15 with rugged planetary axle. Now in stockpiling service, it replaced three smaller trucks and cut the cost of this operation. "Autocar is doing a tremendous job," company officials say, "because it has the power and the performance for our work."

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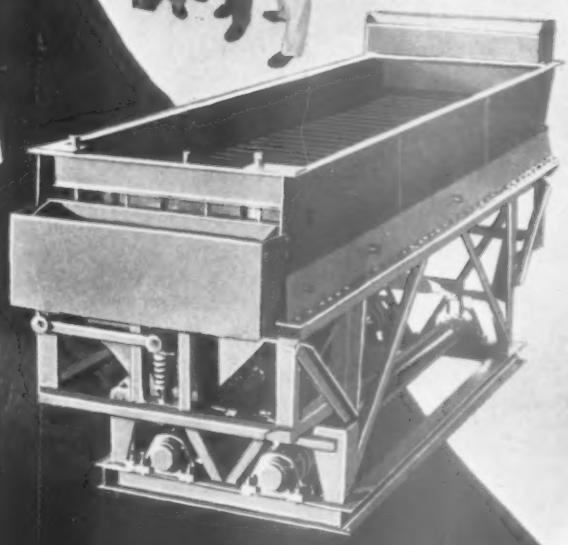
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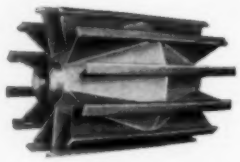
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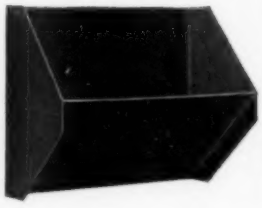
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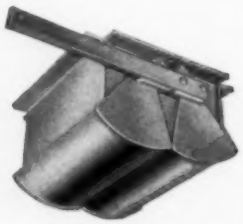
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Compressed air

continued from page 133

the compressor and smooth the flow of air; an aftercooler, to cool the compressed air and remove moisture; an air filter, to prevent the entry of foreign matter into the compressor, and an air silencer to eliminate intake and discharge noises at the compressor.

The following will serve as a guide in avoiding power losses in distribution lines between the air compressor and the using media:

—Pipe sizes should be selected so that power drop between the receiver and the point of use does not exceed 10 percent of initial pressure. Future as well as current needs should be considered in making this selection.

—To minimize pressure drop in hoses, frequent outlets should be provided for the attachment of air-operated equipment. Outlets should be placed at the top of the pipe to avoid carryover of condensed moisture to the equipment.

—A loop system should be used to provide two-way distribution where demand is greatest.

—If an aftercooler is not installed—and as a further safety measure if it is—piping should be arranged sloping towards a trap so that condensed moisture may be prevented from entering air tools and other air-operated devices.

—Large-capacity receivers should be located at the extreme ends of long distribution lines and at points of heavy demand in order to avoid excessive pressure drops in the system.

If compressor capacity is adequate and leakage is negligible, low air pressure must be caused by inadequate piping. Since labor is the most important factor, 4-in. pipe costs little more to install than 3-in. pipe, and the danger of inadequate piping is eliminated.

Tool efficiency has a significant effect upon unit cost of production. A full 90 psi. pressure is required at the tool if maximum efficiency is to be obtained. Compressor pressure may be 90 lb., but if only 60 lb. is available at the tool a loss in production of 25-60 percent can result. If this condition exists, an immediate check must be made of pipes, valves, fittings and air hose to determine whether proper size of pipe is used, whether size and length of hose are satisfactory and whether obstruction exists.

END

OUTPUT OF ILMENITE in India increased from 251,000 long tons in 1955 to 334,000 tons in 1956, or about 33 percent. Consumption of the material in that country is negligible, with about 7 tons per day consumed by a titanium pigment plant.

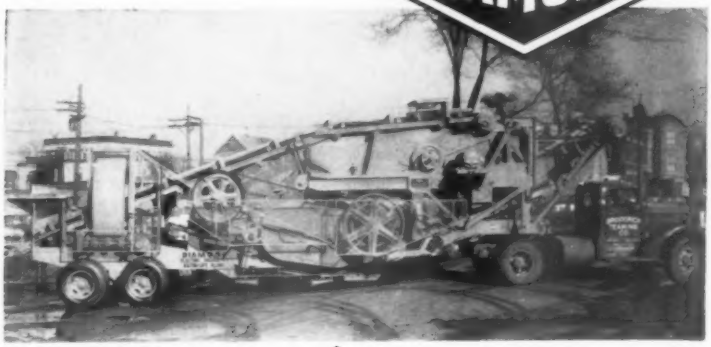
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Aerial tramway

continued from page 118

way, the crushed boulders are separated into three piles of stone and one of sand.

Material is recovered from any of the stockpiles by being allowed to flow to a feeder which delivers to a belt conveyor. The gravel is washed in scrubbers, which also break up clay balls and remove any fine matter that would be deleterious to the concrete mixture. The gravel is then check-screened, and any undersize is carried to bins from which it is taken back to the raw gravel stockpile.

Sand drawn from the sand pile is further cleaned, sprayed, classified, sized and treated and stocked in three sizes. Finally, gravel and sand of various sizes are fed at controlled rates to form the blend called for at the time the concrete is mixed, and the blend is elevated to bins which feed the buckets of the ropeway for the journey to the dam.

One hundred and fifty electric motors drive the conveyors, crushers, screens, pumps, scrubbers and other equipment in the plant. Nearly 100 of these motors can operate at one time. The comprehensive electrical control scheme enables the necessary motors to be started promptly in the correct sequence and to be stopped as required. The control system also ensures that if any machine stops, all those feeding it are automatically switched off, while subsequent processing units to which it was delivering continue to run, at least until cleared.

END



FOUND THE TROUBLE, CHIEF—MUST HAVE DROPPED ONE OF MY WIFE'S BISCUITS INTO THE CRUSHER.

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"CASE® TerraTrac® Crawler stands up BEST IN SAND"

- says leading producer



Port Silica Sand Co., Inc., Port Elizabeth, N.J., processes 1000 tons a day of *extremely fine* silica sand. Mined by hydraulic dredge, the sand is washed, treated, and shipped to users throughout the U.S. and Canada for sand blasting, blast furnace lining, foundry molding, and other industrial purposes.

Most versatile piece of equipment in the company's operation is their highly maneuverable 1½-cu. yd. Case TerraTrac Model 800 tractor-shovel. This 80 HP crawler-rig strips overburden, stockpiles sand, loads railroad cars and trucks, spots cars, and charges the dryer.

Hardly any downtime in over 600 hrs.

Company President Lewis Fitzgerald reports, *"The 800 has held up better than any machine we've ever owned.* In over 600 hours of operation, in highly abrasive silica sand, we've experienced hardly any downtime."

Biggest reason is the exclusive Case *counter-rotating* Terramatic transmission, which enables the operator to maneuver the "800" easier, with one track driving *forward* and the other in *reverse*. This eliminates the grinding, plowing action of "dead track" turns, which tend to wear out tracks on conventional crawlers in a hurry particularly under such abrasive conditions. In addition, TerraTrac's exclusive, hydraulic torque-converter drive cushions jolting shocks, cuts wear and tear on power train and mounted equipment.

Operator likes advanced features

Another "prize feature" according to operator Everett Thompson, is the *torsion-bar track suspension,* which keeps the "800" level and gives it better traction for climbing and loading big stockpiles of soft sand. (Blasting sand runs from .00 to 4 screen; foundry sand from 20 to 110 screen.) Operator Thompson also appreciates the finger-tip hydraulic controls and the ability to change speed or direction on-the-go, without clutching or shifting gears. "I do more work in less time, and am not so beat at the end of the day," he says.

If your materials-handling problem requires the extra flotation and traction of a *crawler* — plus the ability to withstand *extremely abrasive* conditions — it will pay you to investigate the Terramatic "800" — or the bigger 2-cu. yd. "1000" — soon. Your nearby Case Industrial Dealer will gladly demonstrate anywhere, anytime — without obligation. Call him today, or send coupon for free literature and name of nearest dealer.

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Aggregate review

continued from page 100

Where water is scarce, several operators use liquid cyclones to de-silt the plant's waste water before sending the water to the tailing pond. This practice reduces the amount of clam-shell or dragline work needed to keep the pond large enough for normal uses. Several producers realize the value of using a coagulant to help settle the slimes in a pond, thereby permitting re-use of wash waters with minimum pump wear. One operator uses 20-25 cents worth of a coagulant per day. This chemical settles the slimes so fast that only a fraction of the settling area is now muddy.

Several new sand and gravel plants are in operation in the West. Older ones have been progressively rebuilt. In some instances the rebuilding was due to well-used equipment; in others to a desire to step up production and to round out a more efficient operation.

END

Aggregate washing

continued from page 95

no further washing may be required.

Tables I through III give specifications and operating data for typical scrubbers and washers. These vary according to the manufacturer and are listed here only as a guide. Any manufacturer will furnish his own data and specifications upon request.

With ordinary washing and classifying equipment, it is almost impossible to remove shale particles from minus No. 8 material and still retain the finer mesh sands (100 and 200 mesh) required for, say, mortar sand or plaster sand. For this reason, it may be necessary to manufacture sand from some of the coarser aggregate from which the shale has been removed. Caution is required here, too, because 100 percent elimination of shale from even the coarser material is virtually impossible by any economical method.

The safest way to determine the probable effect of washing on material is to test a representative sample. Accredited testing laboratories will do this for a fee, and, as already indicated, most manufacturers of washing equipment will test the samples prior to making recommendations on type of equipment needed.

Fines (material from ¼ in. down to 200 mesh, and smaller) require a different treatment for washing, classifying and dewatering. However, fines cannot be ignored in the processing of coarse material. Part III will discuss methods and equipment for washing fines. END

Quarry Men Profit from Bucyrus-Erie Shovels ...You Can, Too!



IOWA "We're pleased with the performance of our 22-B shovel. It's steady, fine to operate and doesn't give us any trouble. Downtime is practically nil. We like the 22-B's dipper shape, too. It's not too deep, and really digs in."

These comments were made by Donald Hayes, Sr., owner of the ¾-yd. 22-B shown here. This machine loads limestone at Hayes Quarries, Washington, Iowa. It was purchased in 1955 on the strength of the fine performance of a 22-B which the company had owned for 5½ years.



MISSOURI This 1½-yd. 38-B loads limestone from four quarries that produce stone for strengthening old dikes and revetments along the Missouri River.

At work on the same job, but not shown here, is a Bucyrus-Erie 22-B crane. It is used for secondary breakage in the quarry.

The contractor says that his modern equipment and crew of 32 men are producing stone, driving pile dikes, and doing repair work which would have required a crew of 300 men only a few years ago.

Bucyrus-Erie shovels are built to handle the toughest rock. Their ease of control, their rugged construction mean fast, dependable performance. Available in a complete line of quarry-tested models, Bucyrus-Eries offer features that keep rock moving at a profitable pace. Compare the rock jobs pictured here with your own. Read the capsule stories and sample comments. Then see your nearby Bucyrus-Erie distributor for the full story on shovels up to 4 cubic yards. Write directly to us for full information on Ward Leonard electric machines 2½ yards and larger. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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A Familiar Sign at Scenes of Progress



KANSAS Bucyrus-Eries take to the road to furnish crushed stone. Here, a ¾-yd. 22-B loads base material and stone for use on the Kansas Turnpike. Maintaining a dependable pace day after day, Bucyrus-Erie 22-Bs are big enough to turn out plenty of work, yet light enough for convenient moving, along with portable crusher, to another site.

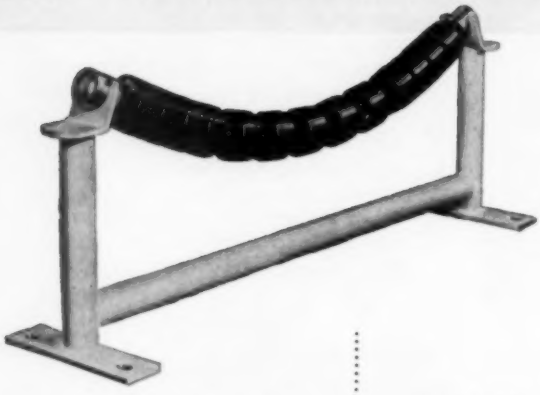


WISCONSIN The limestone here is big and chunky, yet this 2-yd. 51-B handles it easily. The cycle is fast; the operation, smooth. Here, as in quarries from coast to coast, ease of control and low maintenance help boost output. The machine works for Quality Limestone Co., Sussex, Wis.

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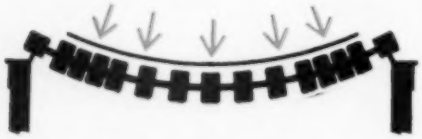
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ROCKY'S NOTES

(Continued from page 19)

sought the services of a lawyer. And here is where the question of gravel being a mineral, under the act quoted, arose.

Court decision: From here on we rely on the decision rendered in December 1957, of the Circuit Court for the County of Roscommon in Chancery in the case of Matthews, plaintiff, vs. Department of Conservation of the State of Michigan. The court said: "It is the plaintiff's claim that under the statute authorizing the reservation [of mineral rights] and the deed given thereunder, sand and gravel were not reserved to the state but passed to the plaintiff." The court then went into the history in connection with the Act of 1909 which empowered the commission to enter into contracts "for taking ore, coal, gas or oil from said lands upon a royalty basis." The court concluded: "Obviously, by the use of the term *ore*, limestone, gravel and sand were not included."

A later act of the legislature (Public Acts of 1917) includes this provision: "That the Public Domain Commission is hereby authorized to sell the limestone, sand, gravel or other nonmetallic minerals." The court reasoned that if the original act had included sand and gravel, this additional provision would not have been necessary. Furthermore, the court reasoned that this later provision referred to taking sand, gravel or stone from land still owned by the state. Later revisions of the act refer to methods by which the state may sell the mineral rights.

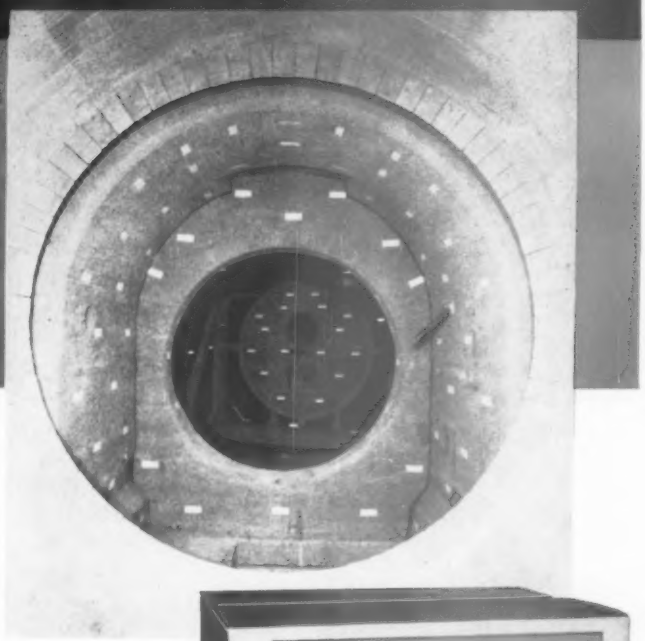
The court said: "As the statute now stands, it seems that the legislature has made clear the distinction between metallic and nonmetallic minerals. While the state owns the land it owns all minerals, metallic and nonmetallic; when the land is sold it owns the mineral rights. The legislature provided for a sale of 'rights' as to metallic minerals but could sell outright the nonmetallic minerals. The state could sell nonmetallic minerals outright because it owned the land and everything it contained. After the land was sold the state had the right to sell only its rights in the metallic minerals, and, of course, coal, oil and gas. It seems clear that the legislature never intended to reserve nonmetallic minerals upon a sale of the land."

The court went further than this by "taking a common-sense practical viewpoint," in which it was argued that the purpose of the act is to get

(Continued on page 166)

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The photograph illustrates A. P. Green SUPER HYBOND as recommended and installed in a typical firing hood. Notice the joint-free surfaces and positive anchorage throughout the lining. These features provide maximum protection against premature failure resulting from dust penetration, bulging, and buckling. Complicated, expensive masonry has been eliminated, as have resulting structural weaknesses.

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ROCKY'S NOTES

(Continued from page 164)

settlers on these cut-over lands, and that the legislature recognized that any sand, gravel or stone they contained was necessary for the owners' construction of dwellings and facilities. Moreover, since the state had means of knowing where usable deposits of sand and gravel were located it was reasonable to believe it would not have sold them but reserved these deposits for its own purposes.

It seems from the record of this court decision, that there have been various legal precedents for it. From quotations of these previous decisions it appears that other courts have taken the position that for the seller to reserve the right to utterly destroy the surface of the land sold, as would be necessary in a sand and gravel operation, "would be an extremely unreasonable one." In other words, had the state retained the mineral rights to the sand and gravel it could have entered the land at any subsequent time and completely destroyed it for the agricultural uses for which it was presumably purchased.

The court's decision reasoned: "If the state can take the gravel, it can take the sand. What then is left of this or any other northern Michigan land sold for agricultural purposes? I cannot concur in a rule of construction of this statute that implies that the legislature intended any such absurdity." The court further ruled that the commission was bound by the statute as it was passed by the legislature in 1909, and had exceeded its authority when subsequently it added "sand, gravel and limestone" to the mineral rights reserved. Consequently, the county court decided for the plaintiff.

The attorney general has appealed to the state supreme court to reverse this finding. In addition to interpreting the legislative acts differently, he states: "One basic principle which should be constantly kept in mind in the instant case is that wherever a sovereign executes a deed to land, all ambiguities or doubts must be resolved in favor of the sovereign. This is contrary to the general rule applicable to transactions of this character between private parties." He cites numerous Michigan court decisions, involving chiefly iron ore deposits.

Help in construing any deed: The attorney general gives the following suggestions to the state supreme court for interpreting a deed for land where the language of the deed may be ambiguous (they might prove helpful to

(Continued on page 169)

Enter 1481 on Reader Card



SEVEN SIZES—½ to 50 HP—420 to 5 rpm—single and two double reduction ratios. Output torque ratings up to 31,500 lb-in.

FALK *ALL-STEEL* Shaft Mounted Drives

Wherever you require a highly efficient, economical speed reducing unit to fit into a limited space, the FALK All-Steel Shaft Mounted Drive meets your needs perfectly. This rugged, compact reducer mounts directly on the driven shaft and is driven through V-belt or chain drive from any convenient rotating power source.

It's hard to match the versatility of a Falk Shaft Mounted Drive. You can choose a single or double reduction unit and use it with any of the many possible sheave or sprocket ratios to obtain almost any specified speed between 420 and 5 rpm. Equally important, the standard Falk Shaft Mounted Drive is available for horizontal and vertical application. Delivery is immediate, installation is quick and easy.

These units are completely FALK-designed and FALK-built for a long life of dependable, trouble-free service. *Precision-cut helical gears of highest efficiency* are employed for efficient, quiet operation.

Always available promptly from factory and distributor stocks, from *coast to coast*. For details, ask your Falk Representative or Distributor—or write for **Bulletin 7100.**

A FEW OF THE MANY APPLICATION FEATURES





VARIABLE SPEEDS through use of variable-pitch sheaves—automatic belt adjustment with tie-rod adjustment



OVERLOAD RELEASE that will slacken belts and cut off power if overload occurs

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 1, WIS.

Representatives and Distributors in Most Principal Cities

Manufacturers of

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

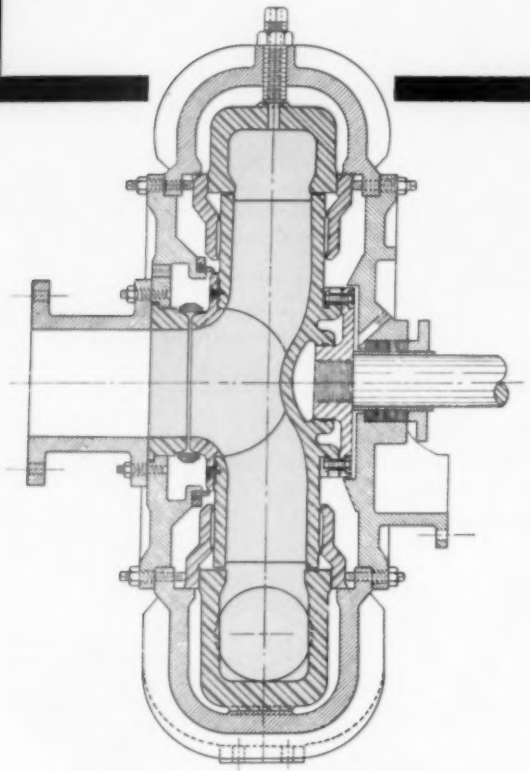
...a good name in industry

"WHICH PUMP Would You Buy"?

IF YOU WERE BUILDING A DREDGE?

A prominent Contractor asked this question of 25 or 30-odd dredge operators. You will be interested in learning of their replies below:





The yellow portion in the above cross section shows the long lived wearing parts of the Thomas Pump. ALL wearing parts are made of Ni-Hard, GENUINE Dependable, Extra Hard, Thomas Ni-Hard.

Thomas design permits this outstanding wear resisting material to perform to its ultimate—to render maximum service.

THOMAS PUMPS AVAILABLE
IN SIZES 6" THROUGH 16" DISCHARGE

In response to a request a Thomas Foundries' Sales Engineer recently visited the above Contractor.

Launching into a sales presentation we were quickly stopped with, "I am going to buy a Thomas Pump. All I want from you now is engineering information —sizes, capacities, power requirements, etc.—it is a Thomas DURABLE Dredge Pump for me."

Like wildfire the Thomas Pump's popularity is spreading, but we wondered why this sudden outburst of enthusiasm, and we inquired why he had made this decision. Continuing, he said: "In each case, in talking with dredge operators, both Thomas users and others, I asked what pump they expected to buy next. The practically unanimous expression of 30-odd dredge operators was 'IT WOULD BE A THOMAS'. I was sold on Thomas Pumps after talking with a dozen of them but continued to visit dredges, trying to decide on other equipment for the dredge I'm going to build."

Further discussions with this man revealed that he, too, had heard repeatedly of the unprecedented long life of wearing parts, higher production, better efficiency, fewer delays and shutdowns for repairs and adjustments. Thus the dredging contractors, the sand and gravel producers have come to realize that—

"YOU CANNOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR DREDGING—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY"

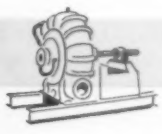




THOMAS FOUNDRIES Inc.

P. O. Box 1111, Birmingham, Alabama





Enter 1554 on Reader Card

ROCKY'S NOTES

(Continued from page 166)

any reader faced with similar problems): "(a) The origin and sources of the transactions; (b) the preliminary negotiations of the parties; (c) all the attendant surrounding circumstances or the existing state of facts; (d) the situation of the parties and of the property; (e) the condition or state of things granted at the time; (f) the state of the country; (g) the relation of the parties; (h) the state of the law at the date of the deed; (i) previous agreements which the deed is to carry into effect; (j) the object or purpose to be subserved; (k) the person by whom the deed is drawn."

Needless to add the attorney general finds the answers to these all in favor of the state conservation commission. So, his conclusions in asking the supreme court to reverse the lower court finding and grant the commission's cross-bill for recovery of the sales value of the gravel removed are as follows: "(1) That the legislative history of the mineral reservation section of the Public Domain Act indicates that sand and gravel were to be included in the ambit of that reservation; (2) that the state through its administrative bodies has for many years construed and functioned on the basis that such mineral reservations would include sand and gravel, and was supported in that construction by an opinion of the attorney general; (3) that sand and gravel is a mineral classified as such by the mineral industry of the State of Michigan and thus is and falls under the definition of mineral, a word contained in the reservation: (4) that the plaintiff in this instant case knew and understood at the time he applied for the purchase of this land that sand and gravel would be included in the reservation in the word "mineral" and purchased this land at the price specified in the application with that knowledge; (5) that the plaintiff when informed of his trespass agreed to make restitution and made attempts to restore the sand and gravel which he had unlawfully removed; (6) that if any doubt or ambiguity exists as to the rights which were conveyed by the State of Michigan, such doubt and ambiguity must be resolved in favor of the sovereign state and against its grantee."

The attorney general ended his plea with the statement: "This case is of utmost importance, since it will decide not just the rights of the parties here before the court but the rights of the state as contained in the mineral reservation in lands totalling approximately two million acres." We will keep track of the disposition of the case by the Supreme Court of Michigan, and let our readers know. In the meantime you and we both can exercise our own legal talents by judging for ourselves who is going to win.

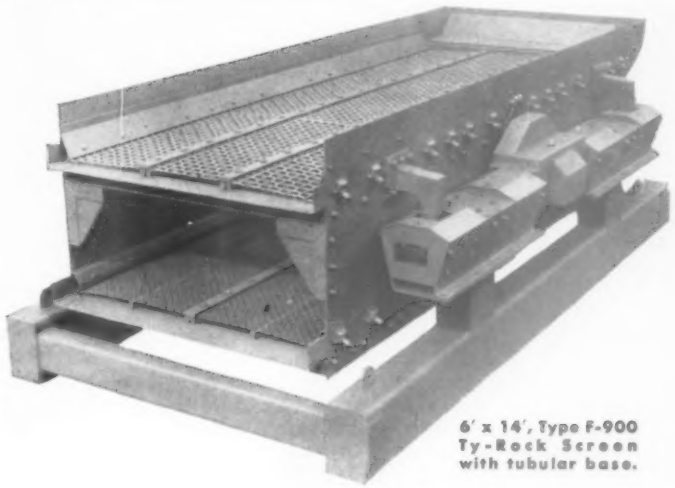
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Cement Reference Lab

AMERICAN SOCIETY FOR TESTING MATERIALS, Philadelphia, Pa., published an article, "Cement Reference Laboratory to Include Concrete Laboratories in Its Inspections," in the *ASTM Bulletin*. Supported jointly by the National Bureau of Standards, ASTM, Bureau of Public Roads and U. S. Corps of Engineers, the Cement Reference Laboratory (CRL) has been a major factor in bringing about a satisfactory degree of uniformity and voluntary agreement among producers and consumers of cement and concrete with regard to methods of testing cements.

There has been pressure upon CRL to include in its work inspection of laboratories which test concrete. This additional work was undertaken beginning March 1, 1958 and will be done at the voluntary request of the laboratory to be visited.

TY-ROCK SCREENS



6' x 14', Type F-900 Ty-Rock Screen with tubular base.

For TOP Performance

The balanced circle-throw action of the Ty-Rock plus the full-floating action on large shear type resilient rubbers enables this screen to separate material with unequalled speed and effectiveness.

The Ty-Rock wastes no power in useless, harmful racking of buildings or supporting members. It delivers all of the intense power to the job of stratifying and separating the sizes.

Telephone HE 1-5400 • *Teletype* CV 586

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

Enter 1451 on Reader Card

NEW U.S. PATENTS

OLIVER S. NORTH

Recently issued patents on nonmetallic minerals*

Asbestos

2,845,378—A friction material comprises a mixture of hard, heat-resistant cohydrolyzate of phenyl silicon trichloride and ethyl silicon trichloride admixed with **asbestos** fiber and bonded to a phenolic resin backing layer. (to J. F. Dereich. Assigned to Diamond Alkali Co.)

2,847,315—A wall and pavement joint and crack sealing compound consists of **asbestos** fiber, **diatomite,** tall oil, petroleum oil residue, balata resin, a drier, and a cationic compound. (to E. M. Turner. Assigned to Mohawk Industries, Inc.)

Cement

2,845,259—Design for a rotary **portland cement** kiln having mounted thereon an apparatus for cooling the clinker and preheating air for use as secondary air of combustion. The clinker is repeatedly lifted and showered through a stream of cooling air. (to K. Henrichsen. Assigned to F. L. Smidth & Co.)

Silica sand

2,847,388—A core mix comprising Ottawa **silica sand,** corn flour, water, and equal parts of raw linseed oil and butylated hexamethylol melamine developed satisfactory bake strength in 30 min., compared with 60 min. for the same composition with the last named ingredient omitted. (to S. H. Rider, T. Anas and W. D. Burke. Assigned to Monsanto Chemical Co.)

Gilsonite

2,846,361—Process for treating **gilsonite,** glance pitch or grahamite to make a suitable feed for a contact coking operation. For example, ground gilsonite is mixed with a hot hydrocarbon liquid at elevated temperature. The resulting melted gilsonite-hydrocarbon slurry is heated to volatilize gilsonite gases while avoiding coking. The liquid hydrocarbon is condensed off, and the stabilized gilsonite withdrawn and coked. (to V. Mekler. Assigned to The Lummus Co.)

Lime

2,845,361—Addition of **lime** increases the viscosity of gelled compositions consisting of tall oil and petroleum oil. (to J. R. Maddox. Assigned to Armstrong Cork Co.)

Mineral wool

2,845,661—Apparatus for uniform distribution of **mineral wool** fibers on a conveyor belt. (to A. K. E. Svende and K. O. Westerlund. Assigned to Hoganas-Billesholms Aktiebolag.)

Phosphate rock

2,844,455—In the production of superphosphate fertilizers from **phosphate rock,** required curing time is reduced by carrying out the acidulation in the presence of a sodium alkylbenzene sulfonate containing from 4 to 6 carbon atoms in the alkyl portion thereof. (to J. C. Harris. Assigned to Monsanto Chemical Co.)

2,845,340—In the manufacture of complex fertilizers from **phosphate rock,** the fluidity of the highly ammonized digested phosphate mixture is improved by adding 20-50% of a potash salt to obtain a pH of 4 to 5. (to K. H. Karbe and W. F. Boos. Assigned to Gewerkschaft Victor.)

2,847,123—A method of drying soft ores, such as pebble **phosphate rock,** to render the ore particles more susceptible to differential charging by contact, so that they are more readily responsive to separation from gangue when passed through an electrostatic field in the freely falling state. Ore is heated to dryness under conditions of high heat transfer and minimum agitation time. (to J. E. Lawver. Assigned to International Minerals & Chemical Corp.)

Vermiculite

2,844,328—Mill for removing contaminating iron minerals from exfoliated **vermiculite,** so that the pure vermiculite can be suspended in a colloidal solution in oils or greases to form highly effective lubricants. In addition, the specifications, but not the claims, describe in some detail the manner of mixing vermiculite and oil. (to B. H. Rouse. By R. M. Rouse, administratrix; one-half assigned to O. G. Rouse.)

Fluorspar

2,846,290—In the production of hydrogen fluoride, 90 percent sulfuric acid is reacted with **fluorspar** in the presence of trichlorobenzene as a diluent, and hydrogen fluoride is recovered from the gaseous product stream. The diluent is used to transfer heat, permit efficient mixing of the reactants by conventional means, and aid in the dispersion of the calcium sulfate product. (to J. C. Yacoe. Assigned to E. I. du Pont de Nemours & Co.)

Miscellaneous

2,846,150—New apparatus and method for the fluid energy grinding of **barite, talc, clay, oystershell** and the like, whereby erosion of the grinding tube is substantially eliminated and, also, relatively low operating temperatures may be employed. The material to be ground is first suspended in a volatilizable liquid, such as water, kerosene, mineral oil, propane, or butane. (to L. T. Work. Assigned to Texaco Development Corp.)

2,846,327—A retarded-set oil well cement comprises **anhydrite, portland cement, bentonite** and water. (to J. A. Wood and E. P. Chapman, Jr. Assigned to Vernon F. Taylor.)

2,847,202—Method for solution mining of soluble minerals, such as common **salt, potash, borax,** etc. The mineral bed is fractured between the input and output wells. (to M. W. Pullen, Jr. Assigned to Food Machinery & Chemical Corp.)

END

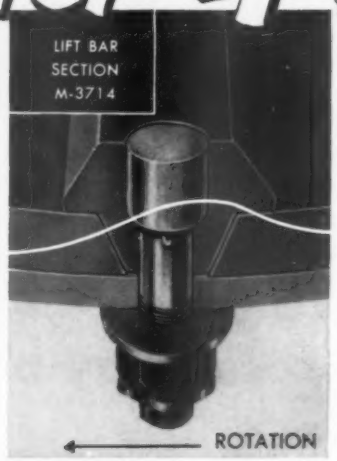
*Copies of United States patents are available at a cost of 25 cents each from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of $5.00 per 20-coupon pad or $25.00 per 100-coupon pad.

Four USS Rolled Plate Linings

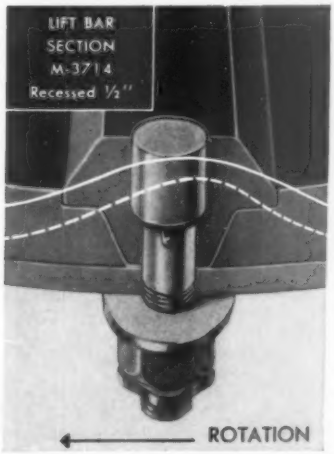
better 4 ways...



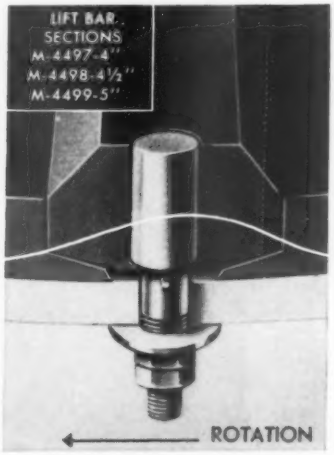
This type of low-cost lining is recommended for cement and soft grinding jobs. Plates are available in 1¼" and 1½" thicknesses. Bars are 6" wide—with 1⅝" lift. Ideal with balls up to 1¼" diameter. Line indicates maximum wear pattern.



Plates are available in 1½", 2", 2½" and 3" thicknesses. Bars are 7" wide—2½" lift. Designed for use with larger diameter balls up to 4". Line indicates maximum wear pattern.



Plates are available in 2", 2½" and 3" thicknesses. Bars are 7" wide. With the ½"-deep plate recesses, lift is 2". Because of the recessed design, bearing surface is retained permitting replacement of lift bars for extended service. Solid line indicates wear pattern with original bars. Dotted line indicates wear line of replacement bars.



Heavy duty linings and lift bars for toughest grinding assignments. Plates are available in 2", 2½" and 3" thicknesses. Bars are 8⅜" wide. Variable lifts from 1⅛" to 2½" are available. Line indicates maximum wear pattern.

These are the only linings made of hot rolled steel. Our bars and plates are special hot worked steel that is given superior toughness which eliminates breakage even when worn to paper thinness.

1. These are the only linings made of *hot rolled* steel. Our bars and plates are special hot worked steel that has the toughness needed to eliminate breakage even when worn to paper thinness.

2. Lift bars are of rolled alloy steel with extra hardness and toughness that provides lift and better grinding efficiency throughout the life of the lining. For more severe service, bars are heat treated.

3. Lift bars and lining plates are made to exact dimensions for close tolerances that permit snug fit and eliminate shell wash—no zincing required.

4. Better design, better materials – they permit the use of thinner linings, thus increasing mill capacity.

Call on us for expert technical assistance on any grinding problem.

USS is a registered trademark

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company

USS United States Steel

Enter 1560 on Reader Card



But the best idea is to use *Quarrycord* for one shot lighting of secondary blasts

Prime with safety fuse and blasting caps. You'll play-it-safe two ways:

- No danger from stray electrical currents or thunderstorms.
- No big "boom!": you get a series of small shots: "pop-pop-pop".

Connect and ignite your safety fuse primers with Quarrycord and play-it-safe *again* because—

- No men on the rock pile. The entire blast is set off by *one* man at a point where escape is safe and easy.

Quarrycord is packed on spools in 100-ft. lengths. It is easily lighted with a match and burns with a very hot open flame at the rate of about one foot per second.

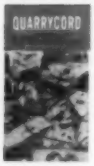


HOW TO USE QUARRYCORD

Cut your safety fuse in equal lengths as prescribed by your State law, and prepare your primer cartridges. On the end of the fuse opposite the blasting cap place a Connector. This is a metal tube containing an ignition compound in the slotted end, and color-banded for easy identification. Load and tamp the holes.

When ready to blast, connect all holes with Quarrycord, placing it in the slot of each Connector and pressing the "lid" down to hold the Quarrycord firmly in place and assist ignition.

Connect your main lines with cross lines wherever these will cut down the over-all burning time. Lead main lines off to a point away from the rock pile. When all is ready, light this end with a match and go to a place of safety.



It's quite a story, told completely in this folder which we'll send you, free, when you ask for it. Write today.

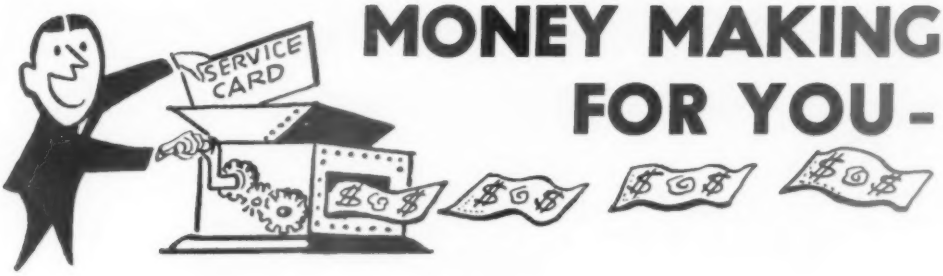
Your explosives supplier can supply Quarrycord and Connectors.

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Primacord® and Detacord® Detonating Fuse, Safety Fuse, Ignitacord®, Quarrycord®, Pyrotechnical Devices and Blasting Accessories

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USE THESE CARDS FOR MORE INFORMATION ON:

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79 W. Monroe St.

OCTOBER, 1958
Chicago 3, Illinois

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MAIN PRODUCT OF PLANT_____ CAPACITY_____

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IF NO KEY NUMBER, USE COMPANY NAME

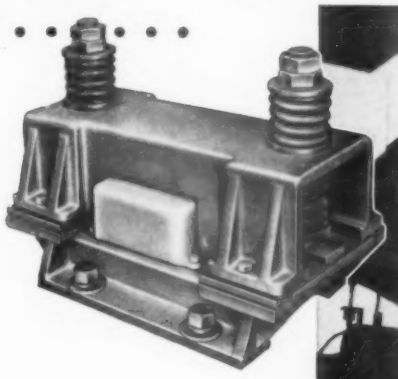
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Each advertisement in this issue is provided with a key number, so is each new machinery and new literature item. For more information on any of these items simply fill in the key numbers in the appropriate space on the adjoining card and send it to us. We'll do the rest.

Eliminate sticking, arching, plugging of bins, hoppers and chutes--Keep them flowing freely with . . . . . .





on sand hopper over feeder



on rock storage hopper

SYNTRON

Pulsating Magnet

BIN VIBRATORS

—— designed to keep materials flowing freely through bins, hoppers and chutes — efficiently, effectively and economically.

—— help processing equipment operate at full capacity by eliminating slow downs or shut downs due to arching and plugging of materials.

—— SYNTRON Bin Vibrators set up waves of powerful, high speed, instantly controllable vibrations, 3600 per minute, that move the most stubborn materials.

SYNTRON engineered Bin Vibrators offer these advantages for low cost operation — versatility, dependability, easy installation and inexpensive maintenance.

SYNTRON Bin Vibrators are built in a wide range of sizes to fill every need from a cubic foot hopper to large bins and bunkers.

Available in electromagnetic, pneumatic or hydraulic powered units.

Solve that troublesome bin problem with SYNTRON Bin Vibrators. Send details to our application engineers or check your telephone directory for the nearest SYNTRON Representative. RP-258

Builders of Quality Equipment for more than one third of a century.

Other SYNTRON Equipment of Proven Dependable Quality

designed to increase production, cut production costs, improve products

Vibrators (bins, hoppers, chutes)
Vibratory Feeders
Vibratory Screens
Shaker Conveyors
Vibratory Elevator Feeders
Weigh Feeders
Packers and Jolters
Hopper Feeders
Lapping Machines
Rectifiers (Silicon and Selenium)
a-c to d-c Selenium Rectifier Units
Electric Heating Panels
Electric Heating Elements
Sinuated Wires
Shaft Seals
Electric Hammers
Concrete Vibrators
Paper Joggers

Our representatives will be glad to work with you in selecting the proper equipment for your operation.

Call your nearest Syntron representative

Write for a SYNTRON Illustrated Catalog — FREE

SYNTRON COMPANY
450 Lexington Ave. Homer City, Penna.

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NEW LITERATURE

Bag packers

H. L. Stoker Co. is offering a fact file folder containing 10 technical data sheets that describe and illustrate current models of its packers for filling valve and open mouth bags. Information is given on the Micro-Metric feeder system for providing accuracy in weight packaging and Model "B" settler, designed to settle the bag while weight accuracy is maintained.

Enter 700 on Reader Card

Feeding systems

Omega Machine Co. has brought out Bulletin 32-R2 describing its line of simplex or duplex gravimetric feeders for liquids or solids, available in capacities from 1 to 60,000 lb. per hour. Dimensional drawings and tables, photos, schematic drawings and performance charts are provided.

Enter 701 on Reader Card

Selective speed drives

Century Electric Co. has issued Bulletin 11-1, P1, on selective speed drives, covering motor speed control from alternating current. Included are descriptions of Types MGS, MGM selective speed drives, Types TH, TF and TA electronic drives and SM magnetic amplifier drives.

Enter 702 on Reader Card

Transmissions

Fuller Mfg. Co. has brought out Form 114 covering its line of single-stick, semi-automatic RoadRanger transmissions. Six models for on-highway and two for off-highway service are described. Included are shifting patterns, gear ratios and specifications for weight, size, mounting, clutch housing and oil capacity.

Enter 703 on Reader Card

Rubber products

Acme Rubber Mfg. Co. is distributing a 72-page catalog covering its line of industrial rubber products used by the processing and mining industries, including various types of hose, conveyor belting, packing, pipe and couplings. Data on uses, product construction and lengths available are included, along with specifications listing diameters, working pressures, weights and plies.

Enter 704 on Reader Card

Welding wire

Air Reduction Sales Co. has prepared Form ADC 873, a pocket guide describing varieties of wire types, diameters and packaging data. It also contains technical information such as chemical composition, mechanical properties and operating procedures. Conformances and approvals are shown for each wire where applicable.

Enter 705 on Reader Card

Wire rope lubricant

The Whitmore Mfg. Co. is distributing a catalog describing applications of its wire rope lubricant. Formerly called cable composition, the product is used to minimize friction and eliminate corrosion in wire rope on many types of machinery, including draglines, steam shovels, elevators and loading equipment.

Enter 706 on Reader Card

Malfunction detector

Robertshaw-Fulton Controls Co. has released Bulletin RF-586 describing the functions of its Model 65 Vibraswitch malfunction detector, a protection device for large motors, pumps and compressors. Included are operating principles, installation diagrams, dimensions and adjustment considerations.

Enter 707 on Reader Card

Crawler tractors

Caterpillar Tractor Co. has released the following booklets describing its crawler tractors: Form D837 features Models D4, D6 and D7; Form D841 features Models D8 and D9. Job studies describe applications in stockpiling and quarry operations and the use of the rock ripper, Low-bowl scraper and other attachments.

Enter 708 on Reader Card

Magnetic separator

Stearns Magnetic Products has prepared Bulletin 1051 describing its three basic Indox V magnetic drum separator models for continuous and automatic removal of tramp iron. A selection chart indicates the size of separator for a given capacity.

Enter 709 on Reader Card

Flexible couplings

T. B. Wood's Sons Co. has revised Bulletin 10100A to cover new additions to its line of Sure-Flex couplings. The additions are: No. 3 (⅜ to ¾-in. bore); No. 4 (½ to 1-in. bore); No. 11 (1⅞ to 2⅝-in. bore); and No. 12 (2⅜ to 2⅞-in. bore). Selection data and other engineering tables also have been revised to include the new sizes.

Enter 710 on Reader Card

Stack linings

Plibrico Co. has prepared Form 75 illustrating and describing monolithic linings for protection of stacks and breechings utilizing its Plicast castable refractories. Information is provided on five insulating grades of the refractor recommended for this service.

Enter 711 on Reader Card

Circular slide rule

General Industrial Co. has introduced a pocket-size circular slide rule for anyone who must perform simple calculations. Operation of the rule is said to be simple and it can be used to multiply, divide and find proportions. Instructions for use are given.

Enter 712 on Reader Card

Two-way radio

General Electric Communication Products Dept. has issued Bulletin ECR 566A on its new portable two-way radio with transistorized receiver. Features covered include sensitivity, receiver design, audibility, standby drain and field servicing.

Enter 713 on Reader Card

(Continued on page 178)

The man with the sharp pencil picks Firestone!



SHOCK-FORTIFIED TIRES MADE WITH FIRESTONE RUBBER-X REDUCE DOWNTIME, LOWER HAULING COSTS!

Where pit mines punish Off-the-Highway tires, records prove that Firestone Off-the-Highway tires are delivering new lows in tire costs! The two big reasons are Firestone Rubber-X and Firestone S/F (Shock-Fortified) Nylon cord! Combined with Firestone S/F Nylon, Firestone Rubber-X adds extra strength to every Firestone tire! Tough Firestone treads and sidewalls defy cuts in the roughest going. Firestone S/F Nylon bodies shrug off bruising shock and impacts. Count on Firestone Off-the-Highway tires to turn down-time losses into worktime profits! Call your Firestone Dealer or Store for tires or tire service.



ROCK GRIP EXCAVATOR® W. B. RIB EXCAVATOR®
TUBELESS OR TUBED

WHEN ORDERING NEW EQUIPMENT ALWAYS SPECIFY FIRESTONE TIRES.

Enjoy the Voice of Firestone every Monday evening on ABC television

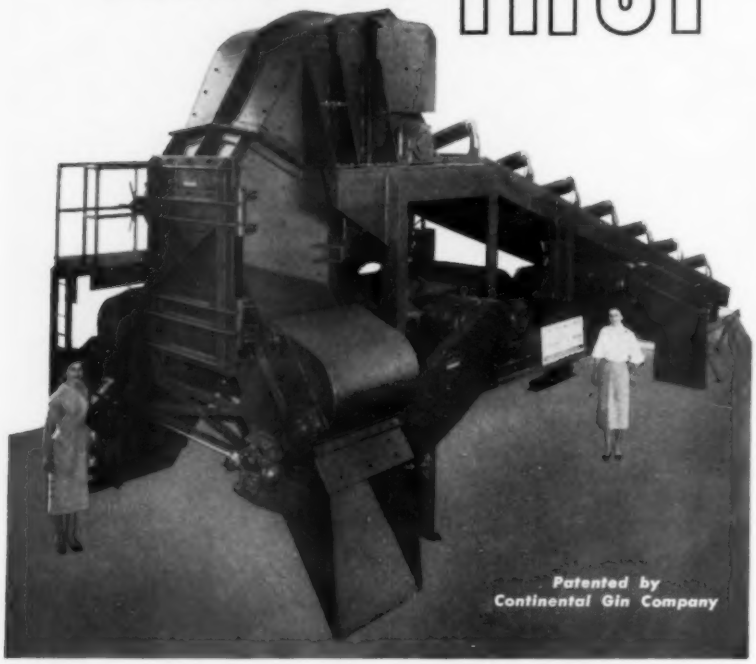
Copyright 1958, The Firestone Tire & Rubber Company

Firestone

BETTER RUBBER FROM START TO FINISH

Enter 1484 on Reader Card

Another Continental "first"



Belt-Powered

Hydraulically Operated Tripper

Developed entirely by Continental, this patented hydraulic tripper was specifically designed for handling explosive, corrosive or similar materials where electric trolley wires and cable reels would present a hazard. Elimination of electrical equipment and mechanical reversing mechanisms, together with their required maintenance, make it an attractive installation for handling all bulk materials.

The unit, fully equipped with hydraulic controls, receives power from the conveyor belt and transmits this power through a hydraulic system to the tripper wheels. There are no clutches or friction drives to corrode during down time. The hydraulically operated spring-set brakes provide tripper positioning without creep, crawl, or accidental release.

Consult your nearest Continental office for complete information.

• *On any conveying or materials handling problem, consult your nearest Continental office.*

CGC

INDUSTRIAL DIVISION

Continental Gin Company

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

Enter 1448 on Reader Card

NEW LITERATURE

(Continued from page 176)

Drives

CUTLER-HAMMER INC. has published Bulletins EN-64 and EN-65 covering its line of Ultraflex E electronic and Ultraflex M magnetic amplifier adjustable speed dc. packaged drives. Sizes and dimensions, schematic sketches and discussions of components and controls are presented.

Enter 714 on Reader Card

Dry feeders

SYNTRON CO. has released a catalog on its "vibra-flow" dry feeder machines for feeding of chemical reagents. Illustrations are presented as well as descriptions, data and specifications on five standard feeders with vibrated hoppers.

Enter 715 on Reader Card

Rock ripper

DOUBLE J BREAKER CO., INC. has described its rock ripper in a recently issued bulletin. In addition to providing specifications and application data, drawings and action photos of the ripper working in various rock formations are presented.

Enter 716 on Reader Card

Bagging scale

RICHARDSON SCALE CO. has brought out Bulletin 3749B describing the design, capacities, gravity or power feed operation and discharge of its E-50 automatic bagging scale. In addition, the bulletin contains engineering drawings, illustrations of suggested feeding arrangements and accessories.

Enter 717 on Reader Card

Aggregate booklet

WESTERN MACHINERY CO. has published Bulletin G7-B25 describing the use of its equipment in the aggregates industry. Charts, working drawings and photos illustrate methods of aggregate preparation, beneficiation and handling.

Enter 718 on Reader Card

Bearing lubrication

U. S. ELECTRICAL MOTORS INC. has published Form 1848 describing its Lubriflush system of motor bearing lubrication. Photos show method of relubrication using a grease gun without motor disassembly.

Enter 719 on Reader Card

(Continued on page 180)

"There is no finer engine than MURPHY DIESEL"

If you're looking for dependable power with maximum operating economy, it will pay you to profit by the experience of so many other pit and quarry operators who have found Murphy Diesel to be "the finest engine on the market."

Talk over your requirements for engines, power units or "packaged" generator sets with your Murphy Diesel Dealer. Ask him to show you how trouble-free Murphy Diesels can help you increase profits.

Sterling Sand and Gravel Co.

TELEPHONE HU 2-2282
1800 NORTH TAFT HILL ROAD
FORT COLLINS, COLO.

SPECIFICATION CONCRETE MATERIALS

ASPHALT PAVING

April 23, 1957

Murphy Diesel Company
5317 W. Burnham Street
Milwaukee 14, Wisconsin

Gentlemen:

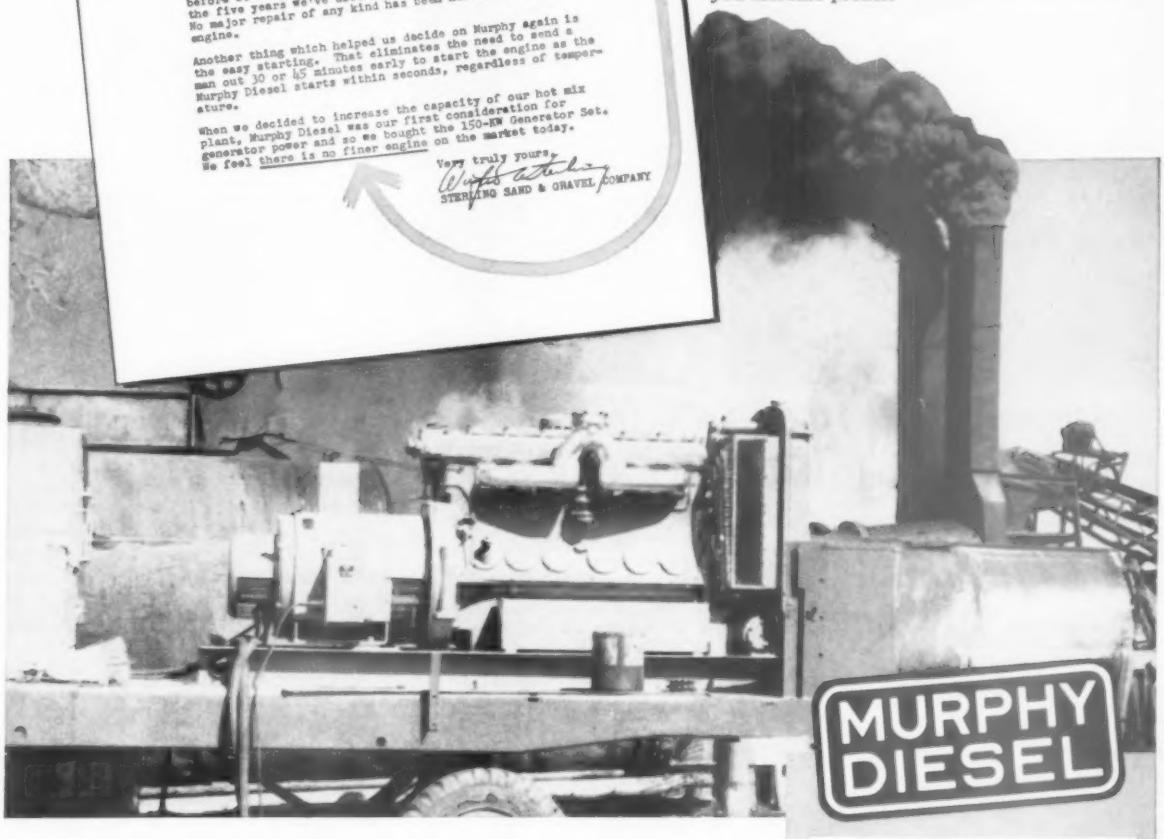
We have recently purchased one of your Model 12½ 150 KW Generator Sets. From our previous experience with the economy and dependability of the Murphy Diesel Model 22-A we've been using for the past five years, we figured we couldn't find a better engine anyplace.

Our old Model 22-A, which is a 100-KW Generator Set, was purchased used in 1952. Hinman Bros. Construction Co., who originally purchased the set, had used it for three years before we bought it. It has given us excellent service in the five years we've used it, with very little maintenance. No major repair of any kind has been necessary on this engine.

Another thing which helped us decide on Murphy again is the easy starting. That eliminates the need to send a man out 30 or 45 minutes early to start the engine as the Murphy Diesel starts within seconds, regardless of temperature.

When we decided to increase the capacity of our hot mix plant, Murphy Diesel was our first consideration for generator power and so we bought the 150-KW Generator Set. We feel there is no finer engine on the market today.

Very truly yours,
STERLING SAND & GRAVEL COMPANY



HEAVY-DUTY POWER

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

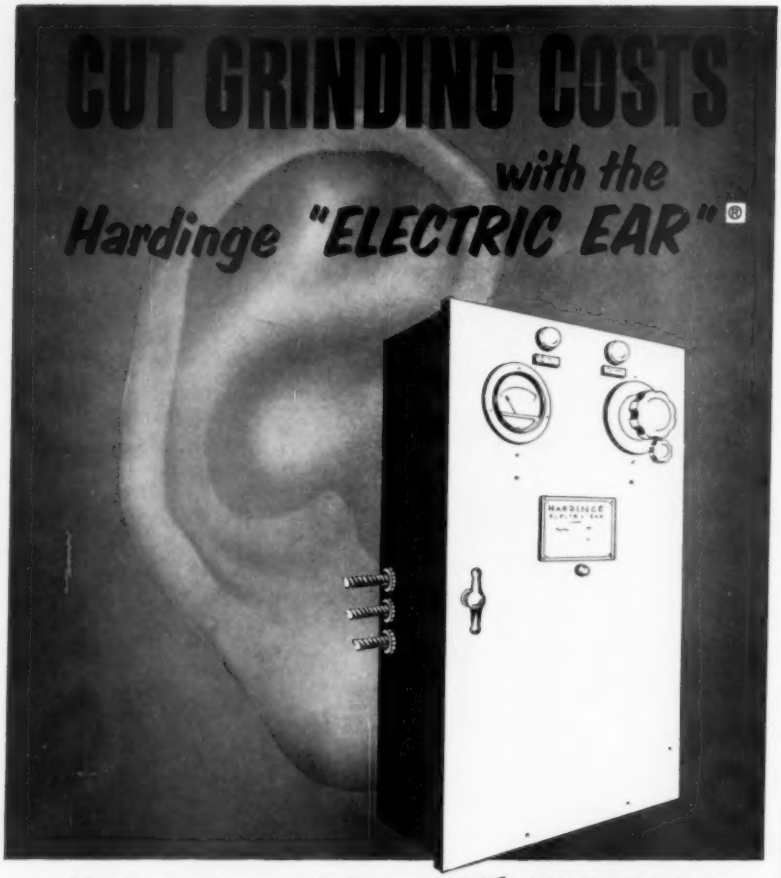
MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

Enter 1449 on Reader Card



Users report 10 to 15% INCREASE in their GRINDING MILL CAPACITY

In a recent survey of Hardinge "Electric Ear" users, many of them reported 10% to 15% increased grinding mill capacity after installing an "Electric Ear." This unit controls the mill feed, based upon grinding sound level, to produce optimum grinding conditions.

Here are a few typical statements from satisfied customers:

"This unit is doing a remarkable job. It reduces steel and liner consumption. We estimate a savings, with our two units, of $6000 per year on grinding balls and liners. Capacity gained 10%."

"Approximately 25% gain in capacity."

"Helps prevent plug-ups."

"Maintains uniform mill load. Estimated gain in capacity 10%."

"We feel this unit is essential to our operation from a proper quality control standpoint. We would not be able to keep up our present rate of accelerated production and quality without it."

"'Electric Ear' is helpful when inexperienced grinders are learning to operate the mills."

"Eliminates human element in mill feed level."

"Saving per year—$10,000.00."

"Principal reason for 'Electric Ear' use is that it aids the operator, and the mill can be operated from a remote panel."

Write for Hardinge Catalog No. 42-A—7.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA • 240 ARCH ST. • Main Office and Works
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco • Birmingham • Jacksonville Beach

Enter 1461 on Reader Card

NEW LITERATURE

(Continued from page 178)

Dust collector

HAGAN CHEMICALS & CONTROLS, INC. has released Bulletin MSP-124-A describing its aerostatic dust collector designed for use in air pollution control and for product recovery. A sequence of drawings shows relative speeds and flow patterns for various size dust particles as they pass through spiral vaned inlet ports.

Enter 735 on Reader Card

Pumps and valves

THE ALLEN-SHERMAN-HOFF PUMP Co. has brought out the following bulletins: Brochure 857 describes the packless rubber-lined pump for handling abrasives from 25 to 800 gpm.; Brochure 957 covers Flex-Check rubber-lined valves.

Enter 736 on Reader Card

Roller chains

LINK-BELT CO. has made available Book 2657 containing engineering data on its line of steel roller chains and sprockets for both power transmission and conveyor service. Typical installation conditions, formulas, charts and diagrams simplify selection.

Enter 737 on Reader Card

Portable bagging scale

RICHARDSON SCALE CO. has brought out Data Sheet 5803 describing its E-50 portable bagging scale designed for either power or gravity feed. Specifications are provided as well as a discussion of design and construction features.

Enter 738 on Reader Card

Truck tire manual

COOPER TIRE AND RUBBER CO. has published its 1958 truck tire service manual containing information on the matching of tires, choosing of rims, load inflation, load distribution and truck weighing. Also covered are causes of tire failure.

Enter 739 on Reader Card

Weigh feeders

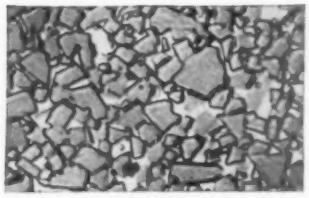
SYNTRON CO. has brought out a catalog covering its weigh feeder equipment, containing descriptions, data and specifications on nine Gravimetric feeders, automatic batch weigh plants and bag weigh machines.

Enter 740 on Reader Card

(Continued on page 182)

Longer bit life— with *new* Sandvik Coromant Bits





Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities —therefore stronger, longer-lived.



Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels — the most widely used in the world — and Sandvik Coromant extension steel equipment.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

		Available Diameters, in Inches														
Type	Thread	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	F	x	x														
	113	x															
	H		x	x	x	x											
	115		x	x													
	D					x	x	x	x	x	x	x	x				
	K												x	x	x	x	
BOTTOMING	1" Rope			x	x	x											
	200			x	x	x											
	1¼" Rope					x	x	x	x		x		x				
	400						x		x		x						
	1½" Rope										x	x	x	x	x		
	600										x	x	x	x			
	700												x	x			
	J. 7.5														x	x	
	2" Rope													x	x	x	x

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, Californ a
LYtell 1-0375

Enter 1553 on Reader Card

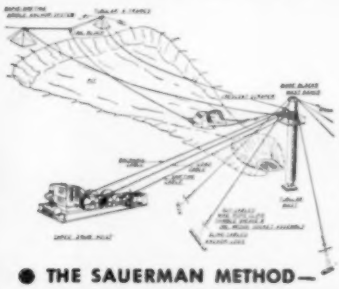
Profitable Sand and Gravel Handling Starts with a Sauerman DragScraper
digging *and hauling to plant*



3-yd. DragScraper digs and hauls sand and gravel from dry pit to plant hopper at 300 fpm.



This 2-yd. DragScraper is dumping river gravel dug from 50 ft. of water into grizzly feeding conveyor to plant. See Sauerman News No. 147.



● **THE SAUERMAN METHOD**— *showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

A Sauerman DragScraper handles the two basic steps of material flow—digging and hauling—in one continuous operation. No double handling is required. You cut labor costs in half—or even more—because a single machine, controlled by one man, replaces the multiple equipment required by other methods.

Profitable handling is further assured by a maintenance cost of only 1½ cents per cu. yd. for the average size Sauerman installation. On larger machines, the increased volume drops this cost still lower. You'll save money on power, too, by eliminating heavy machinery with limited handling-to-dead weight capacity. You pay only the cost of moving the actual digging tool—a Crescent DragScraper.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, depth and plant layout. DragScraper machines in sizes from ⅓ to 15 yds. provide direct delivery to feeder, scalper or crushers at the lowest cost per cu. yd.

Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of sand and gravel excavating machinery experience. Ask for Catalog A (DragScrapers).

SAUERMAN BROS., INC. 630 SO. 28th AVE. BELLWOOD, ILL. Cable: CABEX—Bellwood, Ill

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Enter 1470 on Reader Card

NEW LITERATURE

(Continued from page 180)

Drill lubricant

D-A LUBRICANT CO., INC. has issued a folder providing information on its D-A rock drill lubricant for use particularly in wet quarry operations. Also described is Lubricant 500 which has a heavier consistency and is compounded primarily for Joy TM500 drills.

Enter 741 on Reader Card

Roller bearings

SKF INDUSTRIES, INC. is distributing Bulletin 466 describing its spherical roller bearing designed to absorb heavy load and eccentric motion of vibrating screens. Its rollers and load carrying capacity are that of the "C" type bearing.

Enter 742 on Reader Card

Dust collectors

THE DUCON CO., INC. has issued Bulletin C-958 covering its cyclone dust collectors and gas-tight free-discharge valves for cyclones and other dry dust collectors. Design and structural features are discussed along with performance and selection factors.

Enter 743 on Reader Card

Tandem tractors

THE WHITE MOTOR CO. has prepared Form AD-412 covering its Model 9064 T, gasoline-powered tandem tractor and Form AD-413 describing its Model 9064 TD, diesel-powered tandem tractor. Standard specifications and options are provided in addition to chassis diagrams.

Enter 744 on Reader Card

Recorders

BAILEY METER CO. has released Bulletin E12-5 describing its receiver recorder and controllers for providing chart records of mechanically measured pressures and/or of any measured variables which may be converted into electric or pneumatic signals.

Enter 745 on Reader Card

Head pulleys

WESTERN CONVEYOR CO. has released Bulletin 1-58 on its Schrock motorized head pulleys, available in standard sizes from 1 to 125 hp. Various applications at sand and gravel and crushed stone plants are illustrated.

Enter 746 on Reader Card

END

CAT FUEL INJECTION EQUIPMENT CUTS COSTS BY PROVIDING MAXIMUM ENGINE PERFORMANCE

Presetting at factory for accurate performance eliminates field settings, makes installation of Caterpillar fuel injection pumps quick and simple.

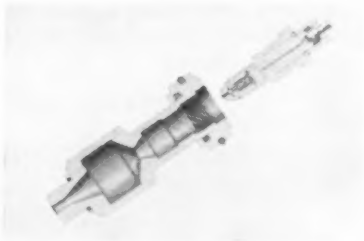
The fuel injection system is a key to peak engine performance. It must deliver to each cylinder equal amounts of fuel at precisely the right time. Deviation means a loss in horsepower. That's why it pays to use Cat fuel injection equipment.

Cat injection equipment can save you money in other ways, too. No field or operating adjustments are necessary. Installation is *quick and simple.* All pumps are interchangeable for different cylinders and between engines of the same model.

This interchangeability permits smaller parts inventories, makes replacement inexpensive by eliminating custom fitting, and makes replacement possible in a matter of *minutes* right on the job regardless of the experience of the mechanic.

Genuine Caterpillar injection equipment is built to last. With clean fuel, a life of 20,000 service meter hours is not unusual.

Pumps, plungers and barrels are manufactured from the finest chromium alloy, so hard that diamond dust is required for lapping the plungers and barrels. Pumps are tested and preset at the factory to provide accurate metering, timing and fuel pressure.



HIGHEST STANDARDS in the industry go into the manufacture of Caterpillar fuel injection equipment. Pump plungers and barrels, for example, are finished to tolerances so fine that the heat from your hand will expand a plunger enough to make it larger than the matching barrel.

SERVICE TIP

Your Caterpillar Dealer has the testing equipment to determine accurately when fuel injection systems parts should be replaced. And testing is the only sure way of knowing.



RUN-IN TESTS—four hours on pumps, two on valves—are conducted on these Caterpillar-built test machines before a pump or valve leaves the factory. Strict testing procedure means perfect performance of genuine Caterpillar injection parts.

Single-orifice fuel injection valves minimize the possibility of clogging or fouling. A spring-loaded plunger within the valve opens by fuel pressure at the proper time for uniform and precise injection. Extra protection is given by a fine-mesh screen. This clean, accurate injection means less down time and lowest fuel cost per unit of power.

Don't risk real damage to your Caterpillar equipment with an improperly functioning fuel injection system. Test systems regularly and replace worn parts with genuine Caterpillar parts. Your Caterpillar Dealer has the full story. See him today. And remember, he stands behind every part he sells.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Improper fuel injection equipment can be expensive. For instance, if a machine's owning and operating cost is $10 per hour, its total cost in a 2,000-hour season is $20,000. For a 200-horsepower machine that's $100 per horsepower. A poorly functioning fuel injection system which robs the machine of 5% of its horsepower (10 HP) could mean a season loss of $1,000 (10 [HP] x $100). Don't take chances. Standardize on Cat equipment.

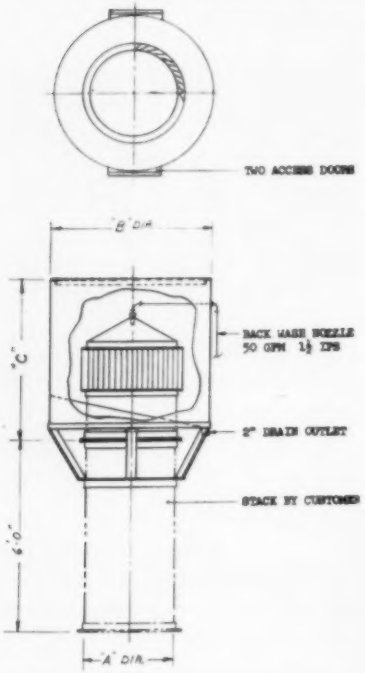
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Enter 1485 on Reader Card

NEW MACHINERY

Centrifugal extractor removes exhaust moisture



A CENTRIFUGAL MOISTURE EXTRACTOR removes free moisture from wet scrubber exhausts. Five sizes are available to handle a range of exhaust gases from 10 to 35 thousand cfm. The new extractor changes the direction of exhaust gas flow from a vertical to a cyclonic path. Centrifugal action imparted by stationary impeller blades removes all free moisture along with some of the entrained dust or solid particles. Moisture impinges on the inside of the outer shell and collects at a drain outlet for disposal.

Cleaning and inspection of the all-welded steel extractor are facilitated by two water-tight, neoprene-gasketed inspection doors and a backwash nozzle at the apex of the stack. The operator-controlled spray both cleans the vanes and flushes the stack. The nozzles consume 45 gpm. at 60 psi. pressure during cleaning operations. *The Johnson-March Corp., Philadelphia 3, Pennsylvania.*

Enter 301 on Reader Card

Build-up electrode

A BUILD-UP ELECTRODE for manual application is said to fulfill the requirements of high tensile strength, resistance to cold flowing under compressive load, high impact strength, low tendency to work hardening and limited increase in hardness under severe quench. The new rod at 250 amp. has a deposition rate of better than 6 lb. per hr. It operates either ac. or dc. (either polarity), and may be applied in either stringer beads or wash passes.

The most common uses of this type of material are as build-up for restoring parts made of carbon and low alloy steels preparatory to an overlay of hard-facing alloys and as final surfacing for parts such as shafts that are to be machined. *Stoody Co., Whittier, California.*

Enter 300 on Reader Card

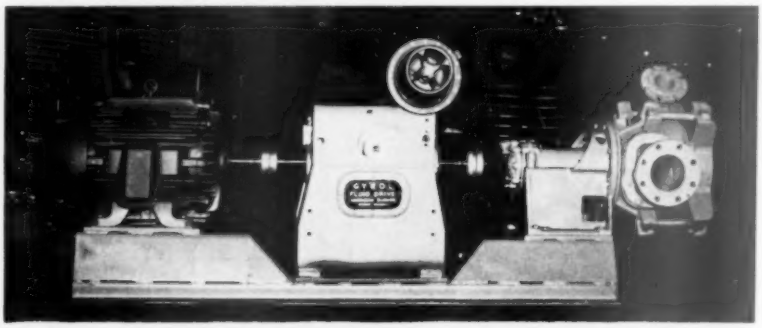


Conveyor belt cleat

A SPECIALLY DESIGNED RUBBER CLEAT can be applied to rubber conveyor belting in the field. This new cleat is applied by the Rema self-vulcanizing process. The prime function of a Rema cleat is to minimize the back-sliding of material on a sloping belt, thereby helping to increase belt tonnage. *Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.*

Enter 302 on Reader Card

Pumps designed to handle abrasive slurries



AN INSTALLATION which successfully meets widely varying demands in pumping requirements is being used by a manufacturer to pump material in abrasive suspension. The arrangement, shown in pre-installation photo, is expected to extend pump life, the pump maker states.

Using seven 4-in. Type R slurry pumps with Gyrol fluid drive, the firm is handling capacities ranging from 300 to 500 gpm. per pump. This variable speed arrangement has practical application in sand and gravel and other fields where slurry pumps are used.

The pumps handle a material of 1.3 sg. which contains sand and other sintered materials. The pumps take their suction at a slight positive head from suction tanks and pump the 190 deg. F. material to overhead screens where the sand and other foreign materials are removed. The screened material then flows by gravity to storage tanks and is pumped to several processes throughout the entire plant.

Total dynamic head varies from 45 to 105 ft. The 40-hp. electric motor has a constant speed of 1,160 rpm. Pump speed is variable from 800 to 1,100 rpm. The Type R pump, made of metal with a Brinell hardness number between 600 and 700, is designed to resist extra wear from fine solids at moderate heads. *Morris Machine Works, Baldwinsville, N.Y.*

Enter 303 on Reader Card

Jaw crusher

A NEW 20 x 36-IN. JAW CRUSHER is of the overhead eccentric type, which means that the moving jaw is suspended from a shaft which also serves as the pitman.

The crusher has a longer jaw than former models for improved angle of nip to reduce "belching." It is hydraulically adjusted for setting to produce materials down to minus 2½ or 3 in. and has a rated capacity under average crushing of 190-200 tph. of minus 6-in. product.

The base is all-welded steel double-wall construction, on which the bearings are saddle-mounted to prevent weave and wobble. Bearings are self-aligning spherical roller types. *Pioneer Engineering, 3200 Como Ave., S. E., Minneapolis 14, Minn.*

Enter 321 on Reader Card

Gelatin explosive

A HIGH-VELOCITY GELATIN explosive for priming low-cost blasting agents is designed to meet the requirements for optimum detonation of free-running blasting agents in quarrying and stripping. The primer cartridge, for example, has a 5-in. sleeve positively attached to and extending along the length of the outer cartridge wall. This sleeve facilitates loading by permitting the primer to slide along the detonating fuse. It also keeps the detonating fuse in close proximity to the cartridge.

The CX-311 cartridge is 2½ in. diam. and 6 in. long. Each unit weighs



about 1½ lb. The company developed this product and package specifically for priming ammonium nitrate (fertilizer grade) and high-density nitrocarbo-nitrate blasting agent. *American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.*

Enter 319 on Reader Card



Tilt-bed trailer

PRODUCTION OF a new 6-ton tilt-bed trailer designed to haul industrial tractors, tractor loaders, tractor-mounted loaders, backhoes and other light and medium industrial equipment has been announced. The 12-deg. tilt of the 79½ in. x 16-ft. platform of the trailer makes it easy to drive equipment onto the bed, which pivots and self-locks into a level transport position. The double-pivot rocker beam tandem assembly, with individual suspension on each side of the trailer, eliminates springs and axles and permits maximum under-bed clearance. It also gives a smooth ride, and keeps the load level over rough terrain, the manufacturer states. *Spencer-Safford Loadcraft, Inc., Augusta, Kan.*

Enter 320 on Reader Card

Diesel engines

A LINE OF DIESEL ENGINES is now being made with an improved unit fuel injector. While keeping the same basic unit injector design, the manufacturer claims to have made fuel injection more efficient by incorporating two convex seat check valves and new injector spring seat. This feature is said to eliminate any possibility of after-dribble or leakage. An improved fuel oil filter also improves injection.

The unit fuel injector is a simple, self-contained unit that acts as both pump and nozzle, eliminating all long, high-pressure fuel lines to prevent erratic, irregular injection. The unit injector is located at the geometric center of the combustion chamber that is at the top of the piston. Improved pressure control forces the solid fuel through a nozzle which atomizes it. The fine fog of fuel is distributed uniformly through the incandescent air charge to provide complete combustion. No pre-combustion chambers, energy cells or hot spots are necessary. This feature is said to reduce fuel consumption to a minimum. *Murphy Diesel Co., 5317 W. Burnham St., Milwaukee 14, Wis.*

Enter 322 on Reader Card

Car shaker cuts unloading time and effort

A LINE OF HEAVY-DUTY air vibrators for unloading covered railroad hopper cars is designed with an exceptionally long piston stroke for maximum amplitude and thrust. The piston is the only moving part. Units have stainless steel mounting head for long life, use no body assembly bolts to wear out or fatigue.

The units cut unloading time on covered hopper cars, eliminate "clean-out" of cars after emptying and free unloading personnel for other work. The manufacturer also states that they are being used successfully on bulk truck trailers carrying potash, cement and similar materials.

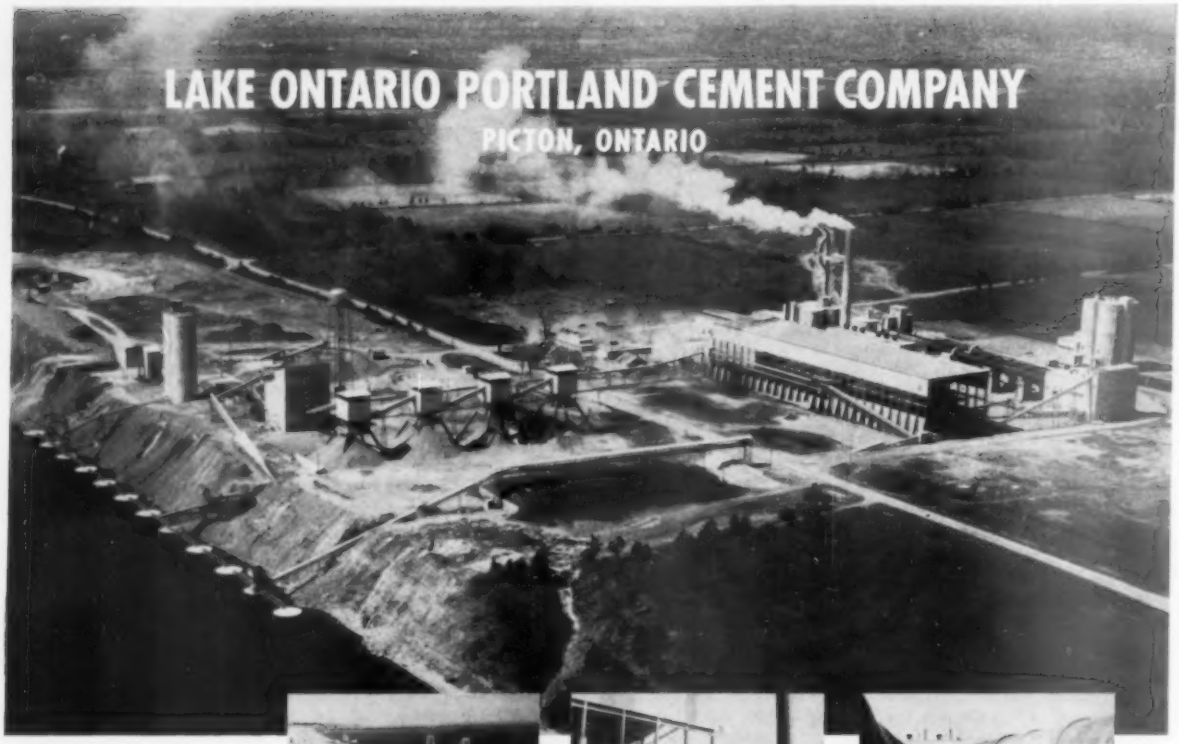
Two models are available, a 3-in. piston size which is 14¼ in. long and weighs 68 lb. and a 4-in. piston size, 17½ in. long, weighing 115 lb. A hydraulic clamp assembly is available for attaching to cars not equipped with standard dove tail brackets. *National*



Air Vibrator Co., 2372 W. Seventh St., Cleveland 13, Ohio.

Enter 323 on Reader Card

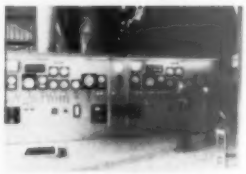
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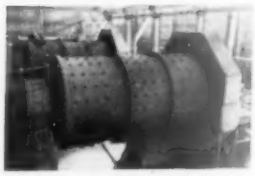












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By

H. J. McFARLAND

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JOHNSON, DRAKE & PIPER, INC.

GENERAL CONTRACTORS

86 TRINITY PLACE NEW YORK, N.Y.

MINNEAPOLIS • NEW YORK • OAKLAND • TERRE HAUTE • HOUSTON

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(Continued from page 185)

Propulsion, pump motors

NEW LOW VOLTAGE, DC. MOTORS for pump drive and propulsion service are Class B insulated and either open or totally-enclosed non-ventilated. Temperature ratings, based on 25 deg. C. ambient, are 90 deg. C. for TENV and 75 deg. C. for open types. The motors are designed for special duty-cycle applications, such as for mining equipment, electrical material handling trucks and related equipment.

Propulsion motors are designed for mounting on truck transmission housings, with the motor shaft pinion engaging the ring gear to drive the wheels. Propulsion motors are normally series wound and are rated for 1-hr. duty.

They are available in ratings from 1 through 8.8 hp.; 1 to 3-hp. units are normally designed for 12-v. operation, the larger ratings for 36-v. service. These motors can be designed for other standard voltages between 12 and 36 v. The series fields for propulsion motors are available in the single or dual field coil type.

Pump drive motors designed for hydraulic power systems carry a 3 or 5 min. rating. They are normally compound wound and are built for 12, 18, 24, 28, 30 and 36-v. operation. Recent production motors range from 1 through 7 hp. Power to operate these motors is usually supplied from batteries or power-packs. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 304 on Reader Card



New truck bodies are detachable

DETACHABLE CONTAINERS, up to and over 40 cu. yd. capacity, are employed in a new system of materials handling. According to the maker, advantages of the new system are: Larger capacity containers; better weight distribution; legal load limits up to 30,000 lb.; unlimited off-the-road capacities; complete hydraulic operation without use of winches, sheaves, telescopic cylinders, cables or chains; all pick-up and handling operations performed without the driver leaving the truck cab; ability to put containers on and off docks.

Mechanically, the "Dempster-Dinosaur" is of simple design. Components are a tilting frame, two hydraulic raising and lowering cylinders and a double-acting bail cylinder, which pulls the containers up the tilting frame (see photo) with a ratcheting action against recessed hooks spaced at intervals under the container.

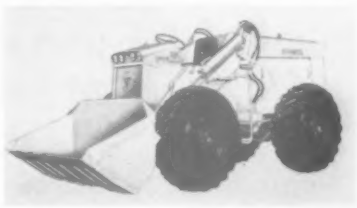
Use in the rock products field will be handling of crushed materials such as shale, sand, limestone, clay, gravel, vermiculite and others in short-haul situations. Another use will be temporary storage and removal of waste products. *Dempster Brothers, Knoxville, Tenn.*

Enter 306 on Reader Card

Front-end loader is added to tractor line

A FOUR-WHEEL DRIVE, 1¾ cu. yd. front-end loader, designated the TL-16 "Tractoloader," has a maximum lifting capacity of 14,000 lb. and a breakout force of up to 18,400 lb.

The bucket tips back 40 deg. at ground level and can be tipped back to an angle of 45 deg. when only 14 in. off the ground. Maximum dumping clearance under the hinge pin is 11½ ft. Under the bucket cutting edge the dumping clearance is 9 ft. 1 in. Reach from the front of the tires to the cutting edge at the maximum dumping



height is 2 ft. 8 in. From the front of the frame the reach is 3 ft.

Power for the unit is provided by a 101-hp., 6-cyl. Hercules gasoline engine or a 97-hp., 6-cyl. Hercules diesel engine. It has a 3.5 to 1 torque converter and a three-speed full power shift transmission. All speeds, in both forward and reverse, are selected by a single lever. Top travel speed in either direction is 27 mph. *Tractomotive Corp., Deerfield, Ill.*

Enter 307 on Reader Card

(Continued on page 188)

Sand classification based on settling rates



A LINE OF SAND CLASSIFICATION tanks of single, double or triple flume design uses a classification method based on the different settling rates of various grain sizes. As water and material being handled enter the feed end, the coarse product settles first, then finer products in successive sizes to the opposite end of the tank where extremely fine sand—material as fine as 200 mesh and under—settles out. At the top of the tank is a series of hydraulic control mechanisms which operate discharge valves at the tank bottom. Two rods extend from each control unit—one to a discharge valve, the other to a four-blade propeller. When material settles on the bottom and builds up to the propellers, torque motors in the control units stall. This closes an electric circuit operating a solenoid valve which causes the valve at tank bottom to open, dumping the product into splitter boxes. When product is clear of the blades, the motors start again, reversing the solenoid valves and allowing discharge valves to close. Product is distributed from splitter boxes through adjustable gates into sectioned collecting flumes to obtain any desired combination of size gradations. *McLanahan and Stone Corp., Hollidaysburg, Pa.*

Enter 305 on Reader Card

localized wear...

is this your wire rope problem?



FREE Red Strand Bulletin No. 106 tells how to lengthen wire rope service life when greatest wear is in specific areas

Why is it that wire rope is often severely damaged near one or both ends while the rest of it is perfectly sound? Obviously, you can't afford to discard the whole rope. So, what can you do to correct or compensate for this condition? These and related questions are fully answered in Service Bulletin No. 106, one of a series designed to help users get more efficient, more economical service from wire rope. Copies are sent free. Write H. K. Porter Company, Inc., Leschen Wire Rope Division, 2727 Hamilton Avenue, St. Louis 12, Missouri.

LESCHEN
Red-Strand
WIRE ROPE

H. K. PORTER COMPANY, INC.
LESCHEN WIRE ROPE DIVISION

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NEW MACHINERY

(Continued from preceding page)



Shuttle dumper

A LARGER-CAPACITY "DUMPTOR" unit, the Model 100, can handle a 10-cu. yd. or 30,000-lb. payload. Speeds up to 20 mph. in either direction are possible because of a constant mesh transmission and torque converter drive. The unit has two speed ranges controlled by hydraulic clutches. Loaded and in low range, the maximum speed is 6¾ mph. A pivoting seat permits the operator to drive in either direction without turning the unit around. Dual steering wheels, throttles and brake pedals are provided.

Both an instantaneous gravity and a controlled dump are possible with the new model. A free-swinging kick-out pan and a 65-deg. dump angle are used to assure complete discharge when wet material is being handled. *Koehring Division, 3026 W. Concordia Ave., Milwaukee 16, Wis.*

Enter 324 on Reader Card

Refraction seismograph



A NEW TECHNIQUE for locating rock without drilling uses sound waves in the earth produced by an impact on the ground surface. The MD-1 refraction seismograph permits determination of depth to bedrock within 5-10 percent, or alternatively permits determining whether rock exists within any specified depth range from the surface to 50 ft. or more. Simple, rapid operation offers the quarry operator a means of locating new quarries, extending present ones or estimating stripping costs. *Geophysical Specialties Co., 4206 Longfellow Ave., Minneapolis 7, Minn.*

Enter 325 on Reader Card

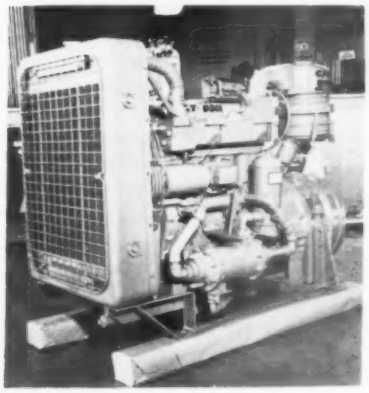
Dacron-neoprene V-belts

A BELTING MANUFACTURER has shifted entire production of industrial V-belts to a new construction of neoprene reinforced with dacron. The dacron reinforcing cords are said to offer high strength to absorb more shock loading, flexibility, length stability following changes in humidity and resistance to abrasion, heat, oil, acids and most alkaline materials.

Neoprene, used in the cover and compression member, provides resistance to oils, heat, abrasion, chemicals and ozone. A dispersion of fibers in the compression member increases flexibility, while providing improved transverse rigidity to maintain the belt's proper position on the sheave. *Boston Woven Hose & Rubber Co., P.O. Box 1071, Boston 3, Mass.*

Enter 326 on Reader Card

Diesel engine



A NEW DIESEL ENGINE has been announced, a 4-cylinder D311 (Series H). This modern, 4-cycle heavy-duty unit has a 4-in. bore and a 5-in. stroke.

The 252-cu. in. displacement engine develops 75 hp. at 2,400 rpm. It has an intermittent output rating of 68 hp. and a continuous rating of 50 hp. at 2,000 rpm. The generator for use with this engine has a 30 kw. continuous rating and is completely self-regulated. A turbocharger which will soon be available will increase all ratings.

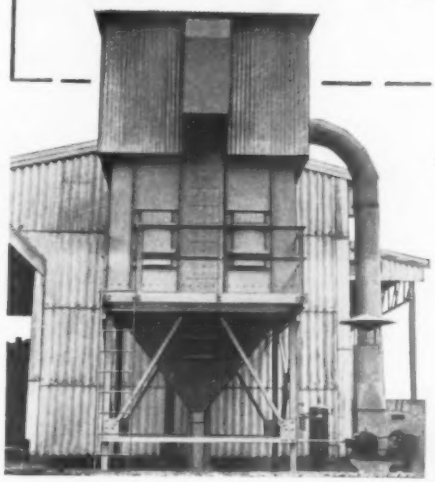
To provide the type of starting best suited to any application, three methods for starting the D311 (Series H) are available. Air or electric is for automatic starting or for applications where speed, safety and convenience are required; for all-weather starting, gasoline starting engine is used. The D311 (Series H) has a new gasoline engine that is side-mounted instead of end-mounted as on the old D311. *Caterpillar Tractor Co., Engine Div., Peoria, Ill.*

Enter 327 on Reader Card

(Continued on following page)

Make your air come clean!

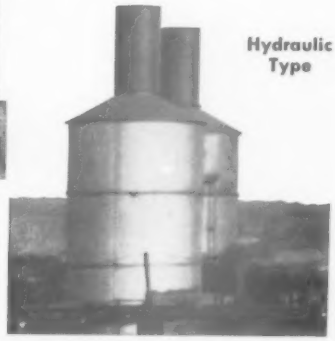
Give Norblo the job of fitting one or more modern types of Collecting Systems to your Dust or Fume problems



Automatic Bag Type

Clean air pays dividends —in employee health and comfort, in protection of work in process, and often, to reclaim valuable materials.

Hydraulic Type



Norblo engineers and manufactures the three types of dust collecting equipment illustrated here in actual use. Norblo recommends the type or combination of types that will give you the best results at most economical cost.

High recovery at low operating and maintenance costs is assured by Norblo engineering and guaranteed performance . . . If you have a dust or fume problem, it pays you to consult Norblo.

Centrifugal Type



The Northern Blower Company

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Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

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USING SCREEN SEPARATIONS?
NOTHING CLASSIFIES AS
PERFECTLY AS AIR



GAYCO
CENTRIFUGAL
AIR
SEPARATORS

Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh.
Timken bearings.
Choice of Standard or Heavy-Duty Models.



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UNIVERSAL ROAD MACHINERY CO.
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Factory and Laboratory: Kingston, N. Y.
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Announcing
new
CAMPBELL
KILN
CHAIN
in two
grades

Carbon Steel . . . and New Thermal-Abrasive Resistant No. 7

Now, Campbell Kiln Chain is available in two types of material and in Proof Coil, BBB or Passing Link styles. Campbell Kiln Chain can be supplied to fit any chain system currently in use, and Campbell components for attaching chain within the kiln can be supplied to the same physical specifications as the chain desired. For details contact your Campbell representative, or write the Engineering Division in York, Pa.

CAMPBELL CHAIN

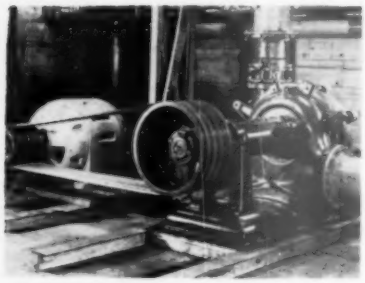
Campbell also manufactures a complete line of chain for all phases of the mining industry.

CAMPBELL CHAIN *Company*
York, Pa.—West Burlington, Iowa • East Cambridge, Mass., Chicago, Ill.
Portland, Ore., Seattle, Wash., Los Angeles, Sacramento, San Francisco, Calif.
Makers of Jiffy Lug-Reinforced Tire Chains and Blue Temper pre-cut, packaged chain

Enter 1459 on Reader Card

NEW MACHINERY

(Continued from preceding page)



Slurry pump

A 10-IN. SLURRY PUMP, an addition to the Model K pump line, is available in a variety of abrasion-resistant alloys and interchangeable, soft-rubber-covered wear parts. Operating features are said to include high efficiency throughout the life of long-wearing parts, continuous trouble-free operation, and low maintenance costs through simplified design, rugged construction and easy replacement of parts. *A. R. Wilfley & Sons, Inc., 635 18th St., Denver, Colo.*

Enter 328 on Reader Card

Helical gear drives



A QUADRUPLE REDUCTION helical gear drive and larger sizes of double and triple reduction drives have been announced. Drives with capacities to more than 200 hp. are available.

The extremely compact quadruple reduction speed reducer, available in five sizes, extends the range of ratios as high as 2,217:1. The simple gear arrangement of these speed reducers consists of helical gear trains operating in high-capacity ball and roller bearings mounted in a cast-iron housing.

Space requirements and layout problems are minimized by locating input and output shafts in the same horizontal and vertical planes. Automatic splash lubrication of all moving parts is said to assure dependable lubrication and operation at all speeds. *Link-Belt Co., Prudential Plaza, Chicago 1, Ill.*

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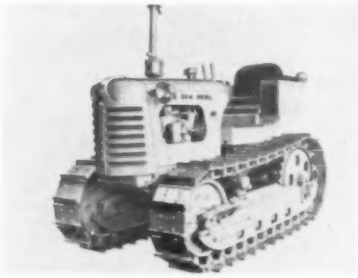
Vibrating-screen bearing

A SPHERICAL ROLLER BEARING is designed to absorb the heavy loads, high speeds and eccentric motion of vibrating screens while meeting rigid lubrication requirements. This bearing has the rollers and load-carrying capacity of the "C" type spherical roller bearing and a cage made of centrifugally cast bronze, having axially drilled and reamed pockets of a shape closely conforming to that of the rollers.

Compared with the original bearing, it has 37 percent more load-carrying capacity and normal fatigue life is extended 2.85 times, says the manufacturer. *SKF Industries, Inc., Front St. & Erie Ave., Philadelphia 32, Pa.*

Enter 337 on Reader Card

Crawler tractors



A NEW LINE of OC-4 crawler tractors featuring added power, availability in both gasoline and diesel models, and important transmission improvements has been announced.

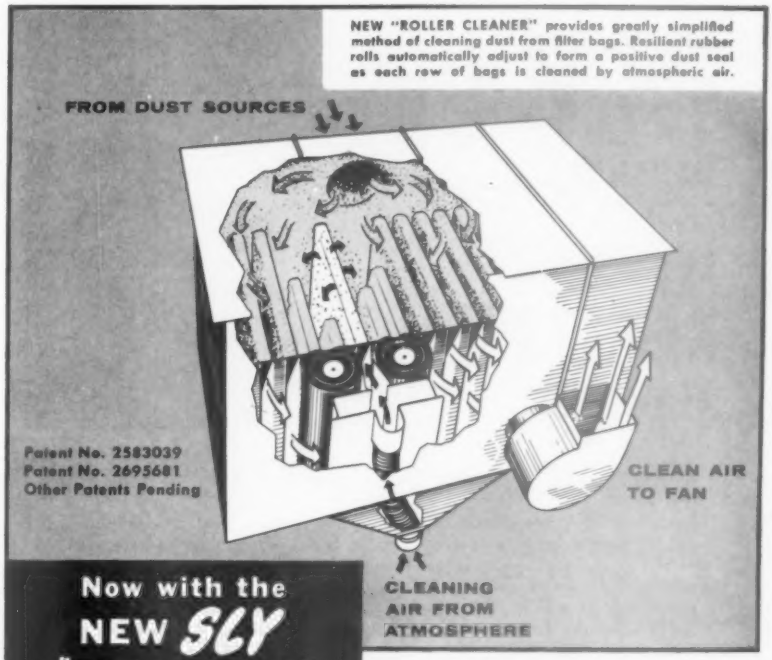
The new engine develops 29 hp. in either the gas or the diesel model, the highest ratings ever available in a tractor of the OC-4 size. Both engines have been so designed that there is 85 percent interchangeability of parts. The gas and the diesel engine are interchangeable with each other. A new heavy duty clutch has also been incorporated into the new models.

One transmission improvement, for which substantial economies in productive working time are claimed by the manufacturer, is known as the "Travel-Reverser." With this auxiliary transmission, the operator can reverse the new OC-4, maintaining the same speed in reverse as in forward, by merely declutching and pulling back a lever.

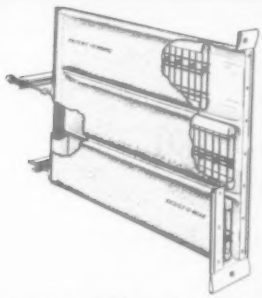
Also available now is a new speed reduction development known as the "Slo-Lo." The operator can reduce any of the four forward and backward speeds by approximately 50 percent simply by declutching and pulling back a lever. *The Oliver Corp., 400 W. Madison St., Chicago 6, Ill.*

Enter 338 on Reader Card

(Continued on following page)



Now with the NEW SLY "ROLL-CLEAN" DYNACLONE



As much as 3 TIMES LONGER BAG LIFE

NEW SLY "RESIST-O-WEAR" FILTER BAGS (patent pending) provide complete dust filtration with as much as three times longer life than conventional bags. This has been proved on the toughest field installations.

The new bag has three equal-size sections. Each pocket has two spacers, making a total of six per bag. Weight is distributed on three seams rather than one, minimizing strain. A special protective flap on the back end prevents abrasion from incoming dust.

Now standard in the new "Roll-Clean" Dynaclone, Sly "Resist-O-Wear" bags combine with all the other superior Dynaclone features to assure greatest dust collecting efficiency with unequalled maintenance-free service.

ALL THESE FEATURES IN ONE DUST FILTER

- New "Resist-O-Wear" bags last as much as three times longer.
- Constant suction at dust sources—complete dust collection.
- Automatically self-cleaning for continuous operation.
- Free-rolling cleaner. Complete dust seal—automatic seal adjustment.
- Greater filtering capacity; smaller space requirements.
- Simplified construction for ease of inspection and servicing.

SEND FOR New Bulletin 105 and New 36-page Dust Control Catalog 104.

SINCE 1870 SLY

THE W. W. SLY MANUFACTURING CO.

4746 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

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WHAT ARE YOUR RESERVES?

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LET US HELP YOU FIND OUT

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Coal in Kentucky . . . Uranium on the Colorado plateau . . . Bauxite in the Ozarks . . . Limestone in Pennsylvania . . . Copper in Montana . . . These are but a few examples of the extent of our operations. Throughout the United States and even in many foreign countries we have successfully explored and proved ore reserves for our many customers, and where normal methods have failed, special techniques have been developed. In the Gas Hills Area of Wyoming, for example, we successfully cored the loose sand and siltstone where others had failed by "freezing" the material. Our personnel and equipment are stationed throughout the United States awaiting your call.

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where there's a
drying operation
leading manufacturers insist*
on DUSTEX COLLECTORS



DUSTEX miniature cyclone tubes, cast of white iron, provide an ultra-hard, cling-free, self-cleaning surface to assure maximum material recovery at a constant, high-speed rate.

DUSTEX patented design prevents condensation within the collector when inlet temperature is above the dew point. Handles temperatures up to 800°F. There are no filters to clog, no sludge to pump. It's virtually maintenance free!

LOW INSTALLATION COST and up to 99.8% efficiency make DUSTEX the perfect collector for spray dryer, rotary dryer or flash dryer processes.

**Name on request*

Write today for this free bulletin on the new D-584 DUST COLLECTOR.

P.O. BOX 2520, BUFFALO 25, N.Y.

DUSTEX CORP.

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NEW MACHINERY

(Continued from preceding page)

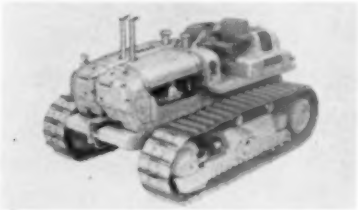
Detonating fuse

A DETONATING FUSE for firing insensitive blasting agents — a 175 grain fuse about ⅜-in. diam.—is said to improve the performance of ammonium nitrate powders by increasing their rate of detonation. In many cases, the new detonating fuse also eliminates the need for a high explosives primer.

The fuse is provided with a tough, waterproof polyethylene coating that won't chip, peel or crack while being laid, the manufacturer claims. It is insensitive to shock, abrasion and stray electrical currents. In addition, it can be detonated only with fuse and cap or electric blasting cap. The new detonating fuse is packaged in 500-ft. reels. *Austin Powder Co., Cleveland 13, Ohio.*

Enter 330 on Reader Card

Crawler tractor

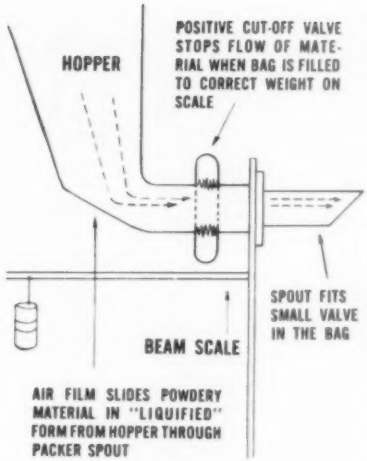


IMPROVEMENTS IN MODEL TC-12 crawler tractor have been announced by Euclid Division of General Motors. This Twin crawler features 402 net horsepower delivered to the power train, two Torqmatic drives with independent planetary track drives, no steering clutches, eight roller track frames, rear mounted cooling system, in-seat starting, fully automatic hydraulic track recoil adjustment and unitized assemblies.

The bare weight of the tractor has been increased from 64,000 to 67,000 lb. plus. In the track system, changes include longer lasting sprockets, improved lubricated idlers, more durable track shoes, wider self-cleaning links and more clearance.

Mounting of components and accessories is simplified. Vibration has been minimized and wearability increased by improvements in components such as drawbar, hood holddowns, oscillation stops and belly guards and shrouds. Engine and filter mountings strengthened to prevent fatiguing and two dry-type cleaners replacing four oil-bath air cleaners are typical of improvements on engine and accessories. *Euclid Division, General Motors Corp., Cleveland 17, Ohio.*

Enter 331 on Reader Card



Valve-bag packer

THE FLUIDIZING AIR PRINCIPLE of conveying powdery and free-flowing materials is employed in this new valve-bag packer. According to the manufacturer, it fills standard valve bags of from 20 to 100 lb. capacity easily. No moving parts are used and no motor is required so that filling operations are accomplished without noise or vibration. The packer is ready to operate when connected with 110-v. ac. service and to standard low-capacity air compressor system. An accurate built-in scale provides close weight control and shuts off the packer automatically when desired weight is reached. *E. D. Coddington Mfg. Co., 5072 N. 37th St., Milwaukee 9, Wis.*

Enter 339 on Reader Card

Belt conveyor

A NEW TYPE OF BELT CONVEYOR features a hammock-style idler suspended on wire ropes which can be erected and taken down quickly and which is said to operate with less spillage, prolong belt life and provide smoother, more economical operation.

The conveyor consists of prefabricated steel stands of uniform size and shape, held in alignment by parallel ⅝-in. wire ropes on either side of the stands. The belt travels on hinged idler rolls mounted in a hammock-shaped frame. Heavy-duty hinges allow the individual rolls to move freely in a vertical plane so that off-center loading of the belt is automatically corrected without de-training the belt. The hammock frames not only support the idler rolls but also serve as spreaders to keep the ropes in their proper lateral position. The idler rolls are equipped with tapered roller bearings and grease and dirt seals. *Hewitt-Robins, Inc., Stamford, Conn.*

Enter 340 on Reader Card

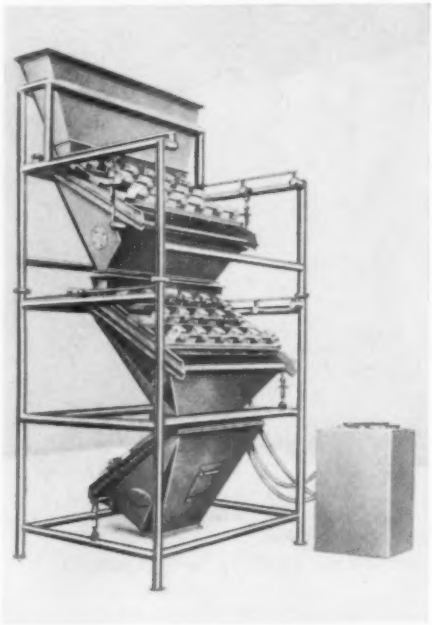
END



GOOD NEWS

FOR SAND PRODUCERS!
NO BLINDING WITH

NoVo SONIC VIBRATING SCREENS



LET US PROVE IT!

No Lost Production Time
Because of Screen Blinding

■

Longer Screen Life
Because of No Brushing

■

More Distinct Classifications
by Particle Size

■

NoVo Screens
Increase Capacity
Five to Seven Times
with One–Third
the Power Requirement

■

Lower Labor
Maintenance Cost

■

No Costly Installations
or Special Foundations

NoVo Sonic Sifting Machines have been tested exhaustively in sand operations and been proven to be the most satisfactory and efficient machines for the job on the market today. NoVo Screens have demonstrated their ability to make sand separations into various particle sizes, while requiring little or no maintenance.

Let us solve your screening problems.
Write for bulletins and catalogues.

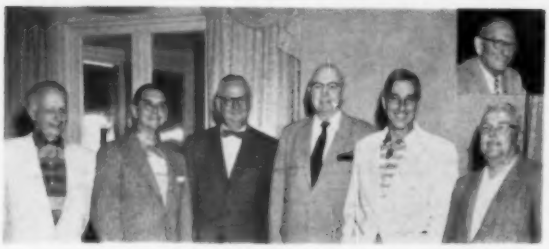
NoVo

Division of **Industrial Enterprises, Inc.**
9705 South Cottage Grove Avenue, Chicago 28, Illinois
In Canada NoVo Screens are manufactured and sold exclusively by **Ferro Enamel (Canada) Ltd.**, Oakville, Ontario

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MANUFACTURERS NEWS

Old chairmen don't fade away





THERE'S STILL AN ACTIVE PLACE for old chairmen—at least, that's what the Manufacturers' Division of National Crushed Stone Association has decided. The group issued special invitations to past chairmen of the division to meet with the executive committee during the midyear meeting of the NCSA Board of Directors at the Homestead, Hot Springs, Va. Half of the living past chairmen were there to offer the benefit of their experience.

Left photo: Cottrell Farrell, 1948-49; I. F. Deister, 1952-53; B. R. Maloney, 1954-55; J. Harper Fulkerson, 1941-43; J. C. McLanahan, 1950-51; Wayne W. King, 1956-57. Abe Goldberg (inset), chairman in 1932-33, was the oldest past chairman present, but was not available when the group picture was made.

Right photo: R. D. Ketner, General Electric Co., won a contest. Well, almost, since he tied with L. C. Mosley of Marion Power Shovel Co. The contest: selling the most tickets for the social festivities at the February, 1958, convention of NCSA. Wayne W. King, W. S. Tyler Co., presented the cup at the Manufacturers' Division midyear executive committee meeting. The cup bulged with a Confederate $20 bill, which Mr. Ketner was supposed to split with Mr. Mosley.

Ned Nyberg is welding consultant

NED NYBERG, associated with Hill Equipment Co., St. Louis, Mo., since 1946, has announced his availability as a welding consultant specializing in fabrication practices, production mechanization and wear control in maintenance. Mr. Nyberg, a graduate of Oklahoma State University, is a director of the St. Louis section of the American Welding Society.

Simplicity appointee

SIMPLICITY ENGINEERING CO., Durand, Mich., has announced the appointment of Arthur Stachowiak as assistant advertising manager for its operations in Durand.

ESCO makes sales changes

CHANGES IN its general sales staff and metallurgical department have been announced by Electric Steel Foundry Co., Portland, Ore. W. R. Barber, assistant to the vice president in charge of sales, assumes the responsibilities of administrative manager of the metallurgical department. Joe E. McQuaid has been appointed general sales manager and Dar G. Johnson, Jr., formerly advertising manager, joins the sales department as assistant general sales manager. Robert L. Zwald becomes advertising manager.

AED acts to solve parts and service problems

CLOSER COOPERATION between distributors and manufacturers of heavy construction equipment to solve problems arising in connection with parts and service is being sought by the Associated Equipment Distributors. At a meeting of the association's Parts and Service Committee, action was initiated to establish a joint-committee relationship with manufacturers whereby such problems could be worked out. The ultimate result will be to increase the service provided users of construction machinery by distributor members of AED throughout the U. S. and Canada.

Tamms opens new plant

TAMMS INDUSTRIES CO., Chicago, Ill., has opened its new plant at McCook, Ill., according to an announcement by E. E. Troyer, president. The plant will be used both for manufacturing and warehousing silica and soapstone products. Also, it includes a research laboratory.

Allis-Chalmers appoints sales promotion director



CHARLES W. PARKER, JR. has been named to the newly created position of director of sales promotion of the Industries Divisions, Allis-Chalmers Mfg. Co., Milwaukee, Wis. Mr. Parker, a graduate of Virginia Military Institute, Lexington, Va., has been associated with the company since 1947. He has served as manager of the Richmond and Philadelphia, Pa. districts.

Included in the new organization are departments for advertising and publications and industrial press. A. R. Tofte has been appointed manager of the publications and industrial press department and J. W. Murphy has been appointed manager of the advertising department.

(Continued on page 196)

Enter 1482 on Reader Card



Digging iron ore on the Mesabi Range near Aurora, Minnesota.

MARION 151-M—Power For Unmatched Digging in Mines and Quarries

A Marion 151-M in action is a familiar sight in many parts of the iron range, in copper mines, coal pits and quarries throughout the world. This 7-yard machine is ruggedly built throughout with ample power for continuous, high-speed production. It is readily convertible to dragline service with boom lengths from 80′ to 120′ and buckets from 4 to 8 yards.



A 40-ton Marion 43-M truck crane loads 69,000 pounds at 13 feet. Such standard features as a torque converter, Marionair Control, power raising and lowering of the gantry and ballast give the operator big advantages. The strong, highly mobile carrier provides maximum maneuverability during travel and on the job.

Consult Marion Mining Specialists for lower costs on your property.

MARION

MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

A Division of Universal Marion Corporation

FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL

Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 1549 on Reader Card

DID YOU BENEFIT FROM SOMETHING YOU READ IN "ROCK PRODUCTS"

Elsewhere in this issue is an order form to make it easy to subscribe for a friend or employee.

Why not pass along the form to people you think should be reading ROCK PRODUCTS every month.

MANUFACTURERS NEWS

(Continued from page 194)

KW-Dart Truck Co. builds new plant

THE RECENTLY MERGED KW-Dart Truck Co., Kansas City, Mo. has announced the start of construction on its new 112,000 sq. ft. building. The new facility will house both the general offices and manufacturing departments. The start of construction represents fulfillment of plans tentatively announced last March. It was at that time that the assets of Dart Truck Co. were purchased by Pacific Car and Foundry Co., Seattle, Washington.

Fairfield district manager

THE FAIRFIELD ENGINEERING CO., Marion, Ohio, has appointed Victor Berg as Eastern district manager. Mr. Berg was formerly with the Worthington Corp. where he was manager of the truck mixer division.

Hyster changes

PAUL HINDS has been named assistant manager of the Tractor Equipment Division, Hyster Co., Portland, Ore., with headquarters in Peoria, Ill. Mr. Hinds formerly was personnel manager of the Peoria plant. Also announced was the appointment of Dean Polson as manager of the Martin Trailer Division plant at Kewanee, Ill. Rex McCormick was made assistant sales manager of the Tractor Equipment Division.

Arthur Severance promoted

ARTHUR T. SEVERANCE has been named regional administration manager of the Multiwall Bag Division of West Virginia Pulp and Paper Co., New York, N.Y. A graduate of Rider College, Trenton, N.J., Mr. Severance joined the company in 1951. At the time of his appointment, he was the head of the commercial analysis group of the Merchant Paper Division.

Cunningham, Gee named by Koehring Division

PHILIP E. CUNNINGHAM has been named new product manager for the excavator line of Koehring Division, Milwaukee, Wis. Mr. Cunningham, a graduate of Marquette University, was formerly employed by a construction equipment distributor.

Also announced was the appointment of Edward R. Gee as a district representative for the northeastern states.

Named Nordberg manager



APPOINTMENT OF Edward L. Satola as advertising manager of Nordberg Manufacturing Co., Milwaukee, Wis., has been announced by Robert E. Friend, president. Mr. Satola has served on the advertising staff in various capacities for six years. A graduate of Fenn College, Cleveland, Ohio, he succeeds Robert E. Schulz who has accepted the position of managing editor of *Diesel Progress* magazine.

Cut Washing or Spraying Cost with CONCENCO® Nozzles



For your washing and spraying operations, CONCENCO spray nozzles are inexpensive, and easy to install. You simply drill oversize holes—one for each nozzle—clamp on, adjust and get results. No tapping or threading required. Machined orifices assure accurate, uniform spray. Ideal for sheet flow or staggered arrangements.

Send for full information.

The DEISTER CONCENTRATOR COMPANY, INC.
915 Glasgow Avenue Fort Wayne, Indiana

Enter 1550 on Reader Card



New Erickson sales manager

THE APPOINTMENT OF James A. Kraker as general sales manager has been announced by Erickson Power Lift Trucks, Inc., Minneapolis, Minn. Mr. Kraker assumes responsibility for coordination of sales and advertising activities. His background includes sales and management experience with Clark and Hyster materials handling equipment.

Manikas is division manager

APPOINTMENT OF George F. Manikas to the position of general manager of the Crosby-Laughlin Division has been announced by American Hoist & Derrick Co., St. Paul, Minn. Mr. Manikas joined the company in 1923 at its South Kearny, N.J., plant and was later appointed plant manager. Recently he has been eastern district manager.

Euclid representative

JOHN SHARDA has been appointed a district sales representative for Euclid Division of General Motors Corp., Cleveland, Ohio. His territory will comprise the states of Illinois, central and southern Wisconsin, eastern Missouri, central and eastern Iowa and Lake County, Indiana. Mr. Sharda, a graduate of Bradley University, has many years of field experience, having worked as a district representative and manager of sales training for another equipment manufacturer.

Kensington opens warehouse

KENSINGTON STEEL DIVISION of Poor & Co., Chicago, Ill. has opened its new warehouse in Virginia, Minn. The facility will be under the direction of Jules Lemberg, formerly a sales representative in the construction equipment field.

END



THE MADSEN MODEL 481 ASPHALT PLANT is ideal for the sand, gravel and crushed stone operator. Check these advantages:

- **CLEAN OPERATION** . . . meets air pollution requirements everywhere.
- **QUICK FIELD ERECTION** . . . factory-matched units stack easily and quickly.
- **AUTOMATIC OPERATION** . . . an optional feature in MADSEN Asphalt Plants.
- **FLEXIBILITY** . . . available in 4000 lb., 5000 lb. and 6000 lb. batch capacities.

Bituminous Mixing is More Profitable with

MADSEN ASPHALT PLANTS

. . . because MADSEN gives you greater production, up to 2000 tons per day — fast, accurate all air operation — lower maintenance costs — and easier accessibility. Get the facts today — see your MADSEN Distributor or write for Catalog.

MADSEN WORKS
BALDWIN-LIMA-HAMILTON
CONSTRUCTION EQUIPMENT DIVISION

COMPLETE PARTS STOCK AVAILABLE IN LOS ANGELES AND LIMA, OHIO

Equipment that Serves

14122 E. ROSECRANS AVE., P.O. BOX 38, LA MIRADA, CALIFORNIA

Enter 1541 on Reader Card

New! CRESCENT MAKES BELT REPAIR HISTORY!

with the new

CRESCENT Belt Repair Kit

featuring

20 ASSORTED SIZES OF FASTENER PLATES and 144 ASSORTED RIVETS IN CORRECT SIZES FOR QUICK, LASTING REPAIRS.



Now make belt repairs no matter what size rip, tear, hole, in a matter of minutes with the handy CRESCENT KIT. Select the right size of plate and rivet from this assortment and all you need is a hammer . . . for a quick and permanent repair. You save many times its cost in longer belt wear by timely repairs.

$4.95

Available from your distributors or write to: RP-4

CRESCENT BELT FASTENER CO.
Serving U. S. Industry since 1897
381 Fourth Avenue • New York 16, N. Y.

Enter 1542 on Reader Card

Memo to Advertisers . . .



Especially those who look beyond the white space of advertising columns when considering sales messages.

Your potential customers and our readers are the same people.

Your success, in what you have to say about your product or service, is directly related to the interest readers take in a publication and what it has to offer.



This A.B.C.* report tells, through audited facts, the story of our responsive circulation audience—how many people, where they live, and how they were influenced to be a part of that audience.

To learn more about your customers, and our readers, ask to see a copy of our latest A.B.C. report.

ROCK PRODUCTS

*The Audit Bureau of Circulations is a non-profit circulation auditing association whose representatives regularly visit member publishers' offices and whose reports provide facts on each publication's circulation. Copies of our latest A.B.C. report are available to interested persons without obligation.

HALLMARK OF CIRCULATION VALUE

AUDITED PAID CIRCULATION ABC

WHERE TO BUY

CLASSIFIED ADVERTISING
RP—WHERE TO BUY—

79 WEST MONROE ST. CHICAGO 3, ILLINOIS

DATE_____

ADVERTISER_____

BY_____

ADDRESS_____

CITY, ZONE & STATE_____

Remittance Enclosed

Terms: 10 days after receipt of invoice

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1- 3	$9.00
4- 8	8.60
9-14	8.40
15-19	8.20
20-30	7.80

Lower rates on a contract basis. Write for rate card.

Mail to: ROCK PRODUCTS, Where To Buy Dept., 79 West Monroe St., Chicago 3, Illinois

FORMS CLOSE 12th of MONTH PRECEDING PUBLICATION

Jan.....	July....
Feb.....	Aug.....
Mar.....	Sept.....
Apr.....	Oct.....
May....	Nov.....
June....	Dec.....

CHECK MONTHS AD TO APPEAR

CRUSHERS

CONE, Symons 7' Super Standard
CONE, Symons 3', 75 HP
GYRATORY, Kennedy, 49, 38½, 37½
JAW, Mitchell, 18" x 9", 25 HP
DOUBLE ROLL, Gruendler, 24" x 24"
RING ROLL, Sturtevant, 14" x 9½"
BABCOCK & WILCOX Type E32, 75 HP
RAYMOND, 6 Roll, Low Side, 200 HP
RAYMOND, 5 Roll, No. 5057 hi-side Mill

JUST PURCHASED

UNUSED Penna. Crusher Swing HAMMERMILL, Non-Clog, Size 5060, Series DNC, Traveling Breaker Plate. Requires 400 HP motor, 1952.

DRYERS & KILNS

11' x 155' Vulcan Kiln, ¾" shell, UNUSED.
8' x 115' Long—½" shell, 2 tires.
8' dia. x 70' L, Ruggles Coles, Double Shell, Indirect-Direct heat, ½" shell.
7' x 80' Vulcan Stone Dryer.
5'6" dia. x 50', Renneburg, ⅜" Shell.
6' x 50', Louisville, Steam Tube.
5'6" x 30', ½" thick Shell.
4'8" x 33', ½ " thick Shell.
4' x 24' L, 5 HP, brick lined.

MILLS

COMPEB, Allis Chalmers, 7' x 24', 450 HP
BALL TUBE, Allis, 5'6" x 22, 150 HP
BALL, Marcy No. 64½, 125 HP
BALL, Marcy No. 66, new liners.
ROD, Kennedy V-S, 5' x 10'.
ROD, Marcy 7' x 15', 300 HP

MISCELLANEOUS

BRIQUETTING PRESSES, Komarek Greaves, 75 HP, 50 HP, 10 HP
PUG MILLS, 25, 50, 150 HP
STEEL BINS—up to 200 tons storage, all welded construction
ALSO—Steel Trough—Belt Conveyors, Bucket Elevators, Steel Screw & Flight Conveyor, etc.

PERRY EQUIPMENT CORP.
1418 N. 6th St., Phila. 22, Pa.
POplar 3-3505

TRACTOR-SHOVELS

Caterpillar "D-6" Used Tractor, S/N 9U-5482 (1950 model), w/Trackson Cable-controlled Hi-Lift Front End Loader. Excellent shape.

Caterpillar "D-4" Used Tractor, S/N 7U-21979SP, w/Trackson Hyd. Front End Loader. Excellent condition.

I-H "TD-9" Used Diesel Tractor w/Hough Hydraulic Front End Loader. Rebuilt tracks.

Terratrac "500" Gas Crawler Tractor, w/-Hyd. Front End Loader.

TRANSIT MIXERS

Jaeger 3 Yd. Hi-Discharge (4¼ yd. Agitator) repaired, blasted & painted. Mounted Chevrolet tandem truck.

Smith 3 Yd. Hi-Discharge (4¼ yd. Agitator) mounted Chevrolet Tandem Axle Truck, low-priced.

CRUSHING EQUIPMENT

Universal "916" R. B. Jaw Crusher*.
Gruendler Port. Pulverizing Plant, 3x8 feeder, "3xB" Mill, 30" belts, discharge conveyor, GM "671" diesel power, 1957 model.

Dixie Port. Pulverizing Plant, 3x8 feeder, 3x8 Cedarapids screen, 3036 Dixie mill, 30" Under-discharge conveyor, GM "671" diesel power unit. 6 years old. Completely overhauled.

Wisconsin Foundry Port. Gravel Plant, feed hopper, 9x35 Jaw, 3018 roll, 4x8 2-deck screen, 24" conveyor, less power. Low priced.

NOTE: All This Equipment Located in our Yard Except

120 S. Pierpont, Phone 4-6706

EIGHMY EQUIPMENT COMPANY
ROCKFORD, ILLINOIS

CLASSIFIERS: 2—Akins and two Wemco 78" double pitch, duplex, 36 ft. steel tanks, complete with motor, drive, etc., New 1956, condition guaranteed. One Door 19' x 8' x 37'6" Bowl & Rake Classifier, complete with motor and controls, New 1956, condition guaranteed.

HEAVY MEDIA PACKAGE UNIT: Semi-portable, bolted construction, capacity 30 TPH, complete with 7 ft. Cone, Densifier, Pumps, Magnetic Separators, Rectifier, Controls, etc. Condition guaranteed. New 1956.

PULVERIZER: Marcy 8' x 12' Rod Mill, center peripheral discharge, complete with 350 H.P. motor, speed reducer, etc. New 1955. Condition guaranteed.

JAW CRUSHERS: Buchanan 36 x 48" type C, with motor and V-belt drive. Pioneer 24 x 36" with motor and drive. Other sizes 4x8" to 48 x 60".

REDUCTION CRUSHERS: Nordberg 4¼ ft. Cone with 200 H.P. motor. Nordberg Gyradise 54" with 200 H.P. motor.

AIR SEPARATORS: 5 ft., 10 ft. and 14 ft.

CARS: 10 yd. capacity Phoenix, standard gauge, heavy duty, quarry type, automatic couplers.

DRYERS, KILNS, COOLERS: Two 8' x 125' Kilns. One 9' x 130' Kiln. One 10' x 200' Kiln. One 104" x 65' Dryer. One 104" x 70' Dryer. One 8' x 50' Dryer. One 3' x 27' Dryer. One 90" x 55' Dryer. One 6' x 50' Cooler. One 5' x 50' and one 5' x 60' Coolers.

SHOVELS: Bucyrus Erie 54-B Electric, 220 volt, 3 phase, 60 cycle, 2½ yd. dipper, offered with or without dragline equipment.

TRUCK CRANES: 4—20-25 ton steel erector's Cranes, 1955, 1956 and 1957 models.

NEW SCREW CONVEYORS: 10—9" with 2 H.P. gearheaded motors. UNUSED.

COMPLETE PULVERIZING PLANT with drying, air separating, dust collecting equipment, and screw feeders, boot bucket elevator, etc. with motor and drives.

LOCOMOTIVES: 4—G.E. and G.M., 80 tons and 90 tons, new 1956, condition like new.

BELT CONVEYOR: 18" x 60 ft. with steel support, all mechanical parts, motor and drive.

MINER: Joy continuous Miner model 3 JCM-4, height 34", width 90", capacity 2 to 4 tons per minute, 440 volt, A.C. Condition like new.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phones: MAdison 3-8300 - 3-8301

MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

EXPERT REPAIR SERVICE
NUSSBAUM ELECTRIC COMPANY
220 E. Douglas Ave., Fort Wayne, Ind.

DEPENDABLE USED MACHINES
Universal 880 Jr. Portable Crushing plant powered by Cat. 8800

Jeep Trencher	35' Universal conveyor	12½ ton Bay City trailer
NW Clam & Drag 8	Bay City 25 dragline	Galion Jr. Patrol Grader
A-W ½ yd. shovel	Mich. truck crane T-6K	Pioneer 3x10 d.d. screen
Agricat bulldozer	Unit 514 ½ yd. backhoe	Fordson backhoe & loader 850
60' Portable conveyor	Port. 30"x38' conveyor	Hopto 120 RTM f/HD-5 hi-lift

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

TRACTOR & EQUIPMENT CO. 10002 Southwest Highway, Oak Lawn, Illinois

$4,500,000 LIQUIDATION

TITANIUM DIOXIDE PLANT

Broening Highway - Baltimore, Md.

1—Traylor 11' x 155' Rotary Kiln, 2 tires, welded, 1" shell.
1—Vulcan 8' x 125' Rotary Kiln, 2 tires, ¾" shell.
2—Vulcan 8' x 50' Rotary Kilns, 2 tires, welded, 1" shell.
2—Vulcan 6' x 60' Rotary Kilns, 2 tires, ¾" shell.
1—Traylor 5' x 50' Rotary Dryer, 2 tires, welded.
1—5' x 24' Rotary Dryer, 2 tires.
1—4' x 25' Rotary Dryer, 2 tires, ⅜" shell.
3—Raymond No. 5057 Five Roll High Side Mills, Double Whizzer.
1—Williams "Standard" Four Roll Mill, Single Whizzer.
2—Abbe 5' x 16' Ball Mills.
5—Mikro Pulverizers, 4TH, 3TH, 2TH.
5—Worthington, Ingersoll Rand Compressors; 1000, 500 & 300 cfm.
5—Dorr Thickener Mechanisms; 70', 50', 40', 16' and 14'.

Steel Buildings; 20 ton Overhead Cranes; Bemis 50 lb. Bag Packer with Sewing Machine; Bucket Elevators 65 to 125 ft. high; Redler Conveyors 5" and 10"; Screw Conveyors 6" and 9", etc.

PARTIAL LIST OF VALUES — CIRCULAR BEING PREPARED

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BRILL EQUIPMENT COMPANY

2401 Third Avenue, New York 51, N.Y. Tel: CYpress 2-5703

OUR 50TH YEAR

24" x 85' Channel Frame Belt Conveyor, Walkway.
30" x 62' Channel Frame Belt Conveyor.
20" x 125' Truss Type Frame, Robins Roller Bearing Idlers.
300 Ft. 20" x 6 Ply Conveyor Belt, 95% New.
2000 BBL. Cement Bin, Aggreg. Bin, Elevator, Screws, 4 Yd. Batch.
25, 30, 40 and 50 H.P. Motors.
50 H.P. 100 R.P.M. Gear Motors.
25 Tons Steel Grating for Walkways, 95% New.
4' x 35' Asphalt Sand Dryer, Complete.
25 Yd. Cedar Rapids Secondary Portable Crushing Plant.
Reliance Jaw Crusher 9" x 16".
Acme Jaw Crusher 9" x 16".
Niagara 1-Deck Screen 2½' x 12'.
Niagara 2-Deck Screen 3' x 8'.
Hummer 1-Deck Screen 6' x 5'.
Revolv. Screen 48" x 20', trunnions.
New Universal 1-Deck Screen, 3' x 5'
New Universal 1-Deck Screen, 3' x 8'

WANTED

SMALL GYRATORY CRUSHERS
JAW CRUSHERS—DEWATERING SCREWS—
—SMALL VIBRATING SCREENS—
CONVEYOR IDLERS—VIBRATING FEEDERS,
SYNTRON OR JEFFREY

G. A. UNVERZAGT & SONS, INC.
136 Coit Street, Irvington 11, N.J.
Essex 3-8105

ELEC. AIR COMPRESSORS
3—3078 CFM Inger. Rand 500 H.P. New 1947
1—3876', 1—1578' and 2—1098' Inger. Rand
DIESEL ELEC. LOCOMOTIVES
4—65 ton Whitcomb 2—25 ton & 1—70 Ton
2—45 ton & 1—80 Gen. Elec.
ROTARY DRYERS & KILNS
36" x 20', 5' x 25', 6' x 72', 9' x 125', 7' x 120'
REDUCTION MILLS & FEEDERS
8'6" x 12' Marcy Rod
6'6" x 14'6" Marcy Rod Mill
4' x 8' Hardinge Rod Mill
5' x 10' Kennedy-Van Saun Rod Mill
2—No. 77 & 1—96 Marcy Ball Mills
4½' Symons Std. Cone Crusher
4'-0' Traylor Type TY Reduction Crusher
24" x 36" Pioneer Jaw Crusher
30" x 42" Pioneer
48" x 60" & 36 x 42 Traylor Jaw Crushers
25B Telsmith Primary Breaker
36" Superior McCully Primary
30" x 36" Traylor Type H Jaw Crusher
24" x 36" Pioneer Jaw Crusher
15x24 & 10x36 Cedar Rapids Jaw
60" x 15' Traylor HD Apron Feeder
VIBRATING SCREENS
5' x 12—3 Deck A.C. "Ripl-flo"
4 ELEC. WHIRLEY CRANES
2 Amer. R25-75 Ganty 165' Boom
2 Amer. R20-60 Ganty 139' Boom

R. C. STANHOPE, INC.
60 E. 42nd St., N Y 17 N.Y.

FOR SALE

PAN CONVEYORS—24" x 18'—30" x 33' —36" x 54'

ELEVATOR—Open inclined 90' centers with steel buckets between two chains.

GRIZZLY ROLLS—Steel frame contains 6 live rollers 12" dia x 36"

SEPARATOR—Dings Magnetic Cross-Belt complete with rectifier and electromagnets. 18" main belt with three crossbelts.

G. & W. H. CORSON, INC.
PLYMOUTH MEETING, PA.

SPECIAL ITEMS
Iowa 53"x60" dbl. Impact hammermill
Sturtevant 16" air separator 75 HP elec. motor
Pangborn CH-2, exhaust blower, etc.
Traylor 56"x72" sectional frame jaw crusher
Traylor 4' Model TY crusher. Numerous spare parts.
Symons 4¼' cone crusher, std. head coarse bowl
Nordberg Gyradisc 54" 200 HP elec. motor
Belt conveyors 24" 36" 42" var. lgths some w/electro mag. hd. pulleys: 24x24" 36x30" 24x50" 36x42".

CONCRETE MIXERS
Ransome Model 84S, 3 yd. tilting type
Smith 422, 4 yd. tilting type
Koehring 56S 2 yd non tilting type

TRUCKS—TRANSIT MIXERS
15 Ford F8-6 yd. end dump. Excel. Reinforced, 1955.
10 Mack LRSW 32 ton rear dump trucks Cummins NHIRS-600 300 HP Diesel Motor Allison converter-transmission.
6 Euclid 36 TD end dumps 300 HP Cummins Diesel
2 Int. RF-192 Haw Knox 6½ yd. 1953.
6 Smith tan. ax. Diesel, 1953, 3½ yd. mixing
4 Smith tan. ax. 4½ yd. mixing

CRUSHERS—KILNS—DRYERS
JAW: Aceme 10x20, 15x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 10x16, 20x36. Diamond 24x36". Cedar Rapids 10x20, 15x36, 20x36, 25x40. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Buchanan Type C 30x42, 36x42. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Pioneer 30x42. Universal 18x24.
GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 16, 18, Telsmith TY 4', 5' Gyrosphere
25B Kennedy Van Saun 12, 37½, 38, 49½"
ROLL: Cedar Rapids 40x20. Pioneer 40x22. Pioneer 30x18. Telsmith 24x16.
HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 24x30, 36" 42". Cedar-Rapids 50-50, 30x33.
BALL MILL: Hardinge conical 10'x48", 8'x48". 8'x36", complete, motors, Traylor 7'x35'.
TUBE MILLS: Smidth 6'6"x21', 5½x20'.
ROD MILL: Marcy 3'x8' center discharge Marcy 3' x 6', Marcy 5' x 12', 8½' x 12' center discharge
AUTOCLAVES: JaCi 6'6"x38' Quick Acting; 6'x50'
CONE: Symons 3', 4¼', 7'.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 6'x72' Vulean 9x100, 10'6"x105', 8'x124', 6'x90', 6'x72'.
DRYERS: 6'x60', 6'x72', 5'x24', 4'6"x32', 3'6"x20', 6'x30', 5'x35' rotary current.
COMPER MILLS: A-C 7'x24', Patterson 7x18.
FEEDERS: Synatron F35 48x72", 48x60", Jeffrey 35x72".

CRUSHING PLANTS
Universal 880 Senior E and 839 Washing plant
C-R NEW NEVER USED complete 2236 jaw, 3033 hammermill, material washer, conveyors, motors etc.
Diamond 77, new 1956, 10x36 jaw, roll, comp Port.
Pioneer Port. 10x24 jaw 24x16 roll compl. Diesel
Cedar Rapids 20x36 jaw crusher Cat. 1S800 Diesel power, 40x22 triple roll crusher.
C-R 2540 Prim. Port. Diesel
A-W 61E 1024-10C6 jaw crusher
C-R Primary Port. 22x36 Jaw. Diesel.
Eagle 36x25" single screwspiral flights washer classifier dehydrator

CONCRETE PLANTS AND EQUIPMENT
NEW, complete, Heltzel, 2-48S Smith tilt. mixers, 4 yd. aggr. batcher 1000 bbl. cement etc.
Butler 1200 bbl ground cement silo re-circulating B-K 3 compt. aggr. 180 ton Heltzel 450 bbl. Cement bin. Complete.
Erie Strayer port. New 1955, 40 yds. per hr. 600 bbl. cement silo
Johnson 400 yd 5 aggr. 1500 bbls. cement batch 5000 bbl. silo 3-2 yd mixers
Johnson automatic batch 10,000 bbls. cement storage 3-2 yd mixers; screening equipment.
Johnson TY 228 2 compt. aggr. w/TY1320 cement unit
Blaw-Knox 100 ton 3 compt. aggregate bin
Blaw-Knox BCPC 600 bbl cement silo
B-K BCPC 400 bbl High cement bin 400 bbl silo.
Blaw-Knox BCPC 300 bbl cement bin
Auto-Crete port. batching plant, self contained, elec. up to 150 yds per day; one man operation.
Pre-Mix 150 ton 4 compt. 3 aggr. 1 cement; ground cement silo 2 yd concrete mixer. New 1955.
Erie Strayer Port. 3 compt. aggr. 600 bbl cement
B-K 2 aggr. one cement 400 bbl silo. Complete

HYDRAULIC SUCTION DREDGES
Morris 10"x8" Diesel. Pontoon mounted.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6".
20' Ellicott Diesel 155'x49'x8'.
8" Hydraulic Diesel. On 32'x8' steel pontoons.
Amsco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.

SCREENS
Trommel 6'x45'3" 75 HP gearhead A.C. motor.
New Holland 4'x12' 2 deck, V-belt drive
Tyler-Hummer 4'x10' 2 deck, new spare parts
Simplicity 5'x12' 2 deck
Pioneer 5'x12' 2 deck 20HP elec. motor
C-R 4'x14' 2 deck 25 HP motor

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30 Church St. New York 7, N.Y.
CO 7-0723 Cable: RICHWALSH

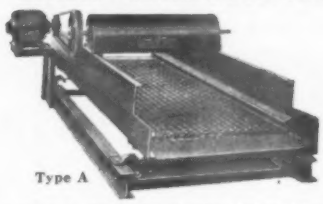
PLANTS: Pioneer 34V, Diamond 37, Telsmith 9B, Univ. 546P, Noble CA506 Batch.
80' 30 ton Shepard Niles Bridge CRANE
CONVEYORS: Gravity Roller, 24x50, 24x290, 36 x151, 60x300', 48x110 Pan
6—12" **DREDGES.** 5—7 ton **DERRICKS**
8' x 48" Hardinge Scrubber, 7x20 Log Washer
Diesel **GEN SETS:** 100 KW, 435 KW, 938 KVA GM. 300 KW & 435 KW F.M.
DRYERS: 4x30, 5x40, 6x50. **KILNS:** 6x60, 7x120, 8x125
CRUSHERS: 1020, 1426, 1824, 2436 w/feeder, 2836, 3042, 4248, 4860 JAW. 1'S". 2'4" Traylor, 9K Gates, 10B, 25B, 18", 36", 48" Telsmith GYR. 2, 3, 4, 7' CONES
25 ton GE Diesel Elec. **LOCO.**
25 ton Browning W2 Wagon **CRANE**
FEEDERS: Hardinge 43B, Synthron F55, AW 3x8.
MILLS: 4½x16", 6x18", 7x36", 6x15 Ball, Williams 4 & 8 Hammer. Raymond 66", Williams Gnome, Roll.
SHOVELS-DRAG: Lorain L850, 820, Lima 602, 1201, 2400, NW6, 80D, BE54B, 120B, 9W, 200W Manitowoc 4500, Koehring 1005.

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8321 Gannon St. Louis 24, Mo. Wydown 1-2826

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NEW CURRENT MODELS - IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES

BONDED® GENERAL DUTY AND HEAVY DUTY VIBRATING SCREENS



Type A



Type B

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted. 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14'. 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST BUY.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%



CONVEYOR PRICES INCLUDE BELTING

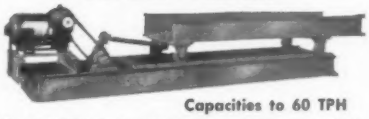
Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 3/16" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Ft.
14"	25'	$1397	$ 722	
14"	50'	2222	1144	$16.84
14"	85'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1088	
16"	60'	2662	1359	18.04
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	
18"	85'	3697	1933	19.24
18"	100'	4252	2220	
18"	130'	5362	2797	
20"	25'	1517	828	
20"	60'	2882	1533	
20"	75'	3467	1838	20.37
20"	90'	4052	2145	
24"	25'	1590	898	
24"	45'	2436	1330	
24"	70'	3480	1875	
24"	100'	4740	2514	21.78
24"	120'	5580	2950	
24"	150'	6840	3602	
30"	50'	2911	1617	
30"	70'	3871	2119	24.75
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	
36"	60'	3638	2096	27.95
36"	100'	5718	3214	

BONDED® FEEDERS



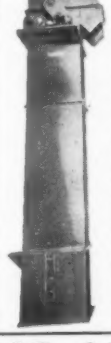
Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers. **Priced From $224.00**

Bonded HDF-18 Heavy Duty Feeders were especially designed for abrasive materials such as Ore, Rock, Crushed Stone, Gravel, Sand, Clinkers, Abrasive Volcanic Ash and Rock. Abrasion Resistant Alloy Steel Plate is used for all parts that contact the material. Capacities to 440 Tons Per Hour.

HDF Series Plate Feeder - Priced From $925.00

WRITE FOR BULLETIN No. 1211



BONDED BUCKET ELEVATORS

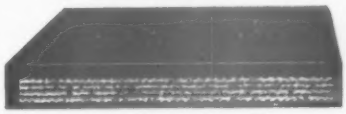
Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models mean lower prices and you get a Custom Built Elevator at no extra cost.

There is a style of bucket for virtually every material or condition: wet or dry, lumpy or fine, granular, slivery, or pellet shapes, hot or chemically active. A complete line of Continuous Steel, Salem Steel and Malleable Iron Buckets available in a wide variety of sizes, shapes, gauges and styles at low prices.

WRITE FOR BULLETIN #1202 AND COMPLETE PRICES.

NEW CONVEYOR BELTING AT NEW LOW PRICES SAVE UP TO 34%

WE PAY FREIGHT ON 200 POUNDS OR OVER



QUALITY TESTED CONVEYOR BELTING*

Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	$3.63 ft.	$2.63 ft.
16"	4	4.08 ft.	2.77 ft.
18"	4	4.51 ft.	3.06 ft.
20"	4	4.97 ft.	3.54 ft.
24"	4	5.85 ft.	3.97 ft.
30"	4	7.18 ft.	4.85 ft.
36"	4	8.51 ft.	5.76 ft.

Major Bee Brand: 16# to 19# Average Friction Pull. 2500# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

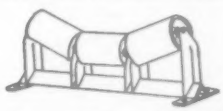
Width	Ply	List Price	Sale Price
14"	4	$ 4.31 ft.	$2.85 ft.
16"	4	4.85 ft.	3.22 ft.
18"	4	5.39 ft.	3.57 ft.
20"	4	5.90 ft.	4.07 ft.
24"	4	6.94 ft.	4.60 ft.
30"	4	8.53 ft.	5.66 ft.
36"	4	10.09 ft.	6.84 ft.
24"	5	8.14 ft.	5.38 ft.

***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1209

IDLERS AND RETURN ROLLS SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

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128 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

QUARRY EQUIPMENT

Cedarapids 3042 double impeller. Rebuilt
Cedarapids 3033 Hammermill with new components.
Cedarapids 3033 Hammermill secondary plant on rubber.
Cedarapids 1236 Twin Jaw Crusher. Excellent.
Cedarapids 1236 Twin Jaw Portable Plant.
Telsmith 13 B gyratory crusher.
Scottdale model 63 double roll coal crusher.
36" x 8'4" apron feeder with drive.
Robins 4' x 9' triple deck screen.
New Holland 4' x 12' double deck screen. Rebuilt
Pioneer 4' x 8' double deck screen. Rebuilt
27½ ton, single-compartment 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two compartment, 13' x 33' bin
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

SHOVELS AND CRANES

P & H 855B-LC, 2-yd. diesel dragline.
P & H 655B1½ yd. diesel dragline reconditioned.
Lorain L-79, 1½-yd. diesel shovel rebuilt.
Bay City 65, 1¼-yd. diesel crane. 55' boom.
Lorain L-25K, ¾-yd. gas clamshell.
Lorain L-41 ¾-yd. diesel backhoe reconditioned.
Lima 34 Paymaster ¾-yard diesel shovel. Good
Unit 1020 ¾-yard diesel powered shovel-crane
Lorain TL25S ¾-yd. gas clam-crane.
Koehring 304 ¾-yd. diesel shovel.
Koehring 304 ¾-yd. diesel backhoe
Wayne 50B, 25-ton truck crane. 18 mos. old.
Lorain MC-414 20-ton Moto-Crane reconditioned.
Link Belt HC-90 25-ton truck crane
Lorain MC-506W 25-ton Moto-Crane.
Lorain MC-425W 25-ton Moto-Crane. New condition.
Lorain MC-4 15-ton Moto-Crane.
Lorain TL-20 10-ton gas Moto-crane.
Lorain SP-107, 7-ton self-propelled crane
Michigan TM16, 10-ton gas truck crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

3—Euclid TS-18 twin engine scrapers.
2—Euclid 18-yd. overhung engine scrapers.
2—Euclid 12-yd. overhung engine scrapers.
1—Euclid 7-yd. overhung engine scraper.
4—Euclid 15½-yd. six wheel scrapers.
2—Euclid 13-yd. bottom dumps. Good.
1—Euclid TC-12 twin engine tractor.
1—Euclid 22-ton rear dump. Good.
1—Euclid 18FD, 18-ton rear dump.
1—Mack LRS 15-ton rear dump. Rebuilt
1—Pullman S-608. 6 to 8 yard scraper.
1—Caterpillar DW-10 hydraulic scraper.
1—International TD-14A tractor with PCU
1—International TD 18 with cable bulldozer blade.
1—Euclid tractor with 3200 gallon water tank semitrailer.
1—Caterpillar D-6 with hydraulic angledozer blade.
1—Caterpillar D-4 Tractor only
1—International 300 tractor, with loader back hoe.
1—Allis-Chalmbers HD-19 tractor with cable bulldozer blade.
1—LaPlante choate 13½-yd. Cable scraper
1—Ateo H85, 10½-yd. Hydraulic scraper
1—Baker-Lull 65 diesel shoveloader. Reconditioned.
1—Hough HA gas front end loader. Reconditioned.

SHOVEL ATTACHMENTS

Lorain 820, 2-yd., 23' boom, 21' stick
Lorain 50, 1-yd., 31' boom, 17' stick
Lorain 40, ¾-yd., 19' boom, 15' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

BACKHOE ATTACHMENTS

Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.

DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 RPM. Rebuilt
Cat. D8800, 88 H.P. at 1000 RPM.
Cat. D13000, 128 H.P. at 1000 RPM. Rebuilt.
GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder. new.

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105 cu. ft. LeRoi tractair with dozer, backhoe.
105 cu. ft. Ingersoll-Rand gas portable
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Conveyor, Elevator, Grader, Chute Lining, Hot Material, Mucker, V-Belts, Transmission



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DONORA, PA.

1—Traylor 10' x120' Rotary Kiln.
2—Ruggles Cole 90" x 55' Rotary Dryer.
2—Herreshoff Furnaces, 20' dia. 16 hearth.
1—Herreshoff Furnace, 16' dia. 10 hearth.
8—18" Belt Conveyors 28 to 170' long.
6—Bucket Elevators 20 to 65' high.
5—Roll Crushers; 54" x 24", 48" x 24", 24" x 24".
6—Steel Bins; 1, 5, 6 & 7 Compartment, 1100 to 12,000 cu. ft.
Steel Buildings; Structural Steel; Overhead Cranes; Screw Conveyors; etc.

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1—New Penn. Non-Clog Hammer Mill, size No. 5060.

OTHER LOCATIONS

1—6' x 50' Rotary Dryer, ⅜" shell.
1—5'6" x 50' Rotary Dryer, ⅜" shell.
1—3'x30' Rotary Dryer, 5/16" shell.
3—Link Belt Roto Louvre Dryers; 6'4" x 24', 3'10" x 20', 3'10" x 16'.
2—Gayco 8' dia. Air Separators.
1—Gayco 5' dia. Air Separator.

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6'-5"x100' Kilns
#1 Sturtevant rotary fine crusher

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1—30" x 36", 24" x 36", 18" x 36", 15" x 30", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls, rebuilt. 36" x 16 rebuilt Sturtevant rolls.
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No. 3 up to No. 12 Gyratory Crushers.

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2—5½'x20', 5'x22', 6'x22', 7'x24' & 7'x35'

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6'x50'x6½'x50'—7½'x50'x8'x60'

We make new dryers and kilns.

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10—30 cu. yd. Western Automatic Air Dump Cars—All steel—50-ton.
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9-W Bucyrus Erie Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 200', 10 yd.
625 Page Diesel Drag, 150', 10 yd.
723 Page Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
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2400 Lima Dragline, 130', 5 yd.
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750-B Bucyrus Erie 20 yd. Elec. Shovel
5480 Marion 18 yd. Elec. H.L. Shovel
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Large selection of smaller Shovels and Draglines available
Model T-750 Reich Truck Mounted Rotary and Down-the-Hole Drill
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7' x 120' Rotary Kilns
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5' x 40' x ⅜ Rotary Kiln
6' x 30' Rotary Coolers
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Robinson #13 Saw Tooth Crusher 15 HP.
Jeffrey Hammermills, 36" x 24"; 24" x 18"; 20" x 12"; 15" x 8" all M.D.
Pennsylvania C-3-30 Hammermill, 60 HP.
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Pug Mills—3'9" x 9' x 12' Vertical
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2000' of 24", 18", & 16" troughing Belt Conveyor
42" x 500' Apron Conveyor, mesh belt
Pug Mills—3'9" x 9' x 12' Vertical
Pug Mills—3' x 13' Horizontal
4' x 6' & 4' x 8' Tyler Hummer Screens
18" x 16', 36" x 6', 48" x 8' Apron Feeders
18 Steel Welded Bins, 15 to 200 ton

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CEDARAPIDS Super Rock-It Portable crushing Plant w/22x25 Jaw, apron feeder, 3033 hammermill, 4x10 screen, rotovator, two delivery conveyors, Twin 671 GM diesel engines, tandem rubber, excellent. $38,750 Yard. Rental Purchase.
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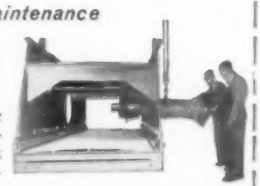
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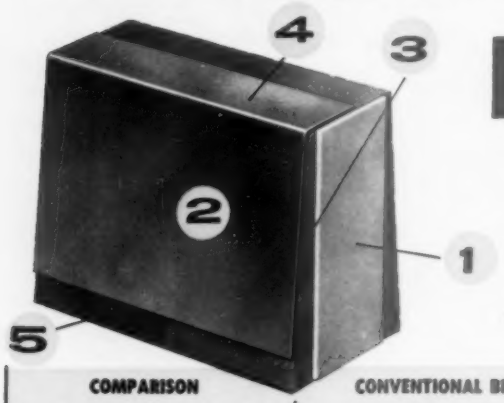
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